CLINICAL SPECTRUM OF ACUTE INTRACEREBRAL HEMORRHAGE (ICH) AND OUTCOME PROGNOSTICATION WITH ICH SCORE

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Dedicated

to

my Family

&

Teachers

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Dr. Ashish Gupta

LIST OF ABBREVIATIONS

AVM	AV malformation
AHA	American Heart Association
CAD	Coronary artery disease
CNS	Central nervous system
CLD	Chronic liver disease
CKD	Chronic kidney disease
CT	Computed Tomography
DM	Diabetes mellitus
EVD	External ventricular drain
GCS	Glasgow coma scale
HG	Hematoma growth
HTN	Hypertension
ICH	Intracerebral hemorrhage
ICH SCORE	Intracerebral hemorrhage score
ICP	Intracranial pressure
IVH	Intraventricular hemorrhage
mRS	Modified rankin scale
MRI	Magnetic Resonance Imaging
OAC’s	Oral anticoagulants
SAH	Subarachnoid hemorrhage
SICH	Spontaneous intracerebral hemorrhage
TIA	Transient ischemic attack

Abstract

Introduction: Acute intracerebral hemorrhage (ICH) is one of the common causes of stroke and is a grave medical emergency of the highest degree with frequent early neurological deterioration or death. It accounts for approximately 10-20% of all strokes and is still the deadliest, most disabling and least treatable type of stroke. This study is designed to study the clinical profile of admitted patients with acute intracerebral hemorrhage (ICH) and to evaluate the utility of ICH score as an outcome predictor.

Aim of study: To study the clinical profile of patients with acute intracerebral hemorrhage (ICH) and to evaluate the utility of ICH score as an outcome predictor in a resource-limited setting.

Methods: A total of 100 acute intracerebral hemorrhage (ICH) patients admitted in departments of Medicine and Neurology in the time period between 1st January 2020 to 31st May 2021 were enrolled. Clinical profile of the patients was studied and ICH score was used as a bedside tool to predict immediate outcome during hospitalization and short term outcome after discharge to identify patients requiring special care to maintain their quality of life.

Results: The majority of the patients (39%) belonged to an age group of 51-70 years with the mean age of 55.19 years. Male preponderance was seen with male to female ratio of 2.1:1. The commonest symptom observed was weakness (86%) in one or more limbs. The most common site of hemorrhage was gangliocapsular (38%) followed by lobar (28%) bleed. Hypertension was identified as an important risk factor with history of hypertension obtained in 81 patients. GCS on admission was identified as an independent predictor of outcome. CT findings such as volume of bleed (≥30cc), intraventricular extension had a significant role in predicting the outcome in patients with ICH. The Intracerebral hemorrhage score (ICH score) calculated at the time of presentation to the hospital was used as a simple tool for risk stratification as well as prognostication of outcome. Morbidity and mortality increased steadily with ICH score.

Conclusion: Majority of the ICH patients are males, with a peak age group of 51-70 years. Hypertension, increasing age, male sex, diabetes, alcoholism, CLD, CKD and coagulopathy are the major risk factors. GCS on admission is an independent predictor of outcome. CT findings such as volume of bleed (≥30cc), intraventricular extension, have a significant role in predicting the outcome in patients with ICH. The Intracerebral hemorrhage score (ICH score) calculated at the time of presentation to the hospital can be used as a simple tool for risk stratification as well as prognostication of outcome.

Keywords: intracerebral hemorrhage, intracerebral hemorrhage score, clinical profile, GCS, volume of bleed, intraventricular extension

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INTRODUCTION

Stroke is classically characterized as a neurological deficit attributed to an acute focal injury of the central nervous system by a vascular cause.[1] It includes cerebral infarction, intracerebral hemorrhage (ICH), and subarachnoid hemorrhage (SAH).

Acute intracerebral hemorrhage is one of the common causes of stroke and is a grave medical emergency of the highest degree with frequent early neurological deterioration or death. It accounts for approximately 10-20% of all strokes and is still the deadliest, most disabling and least treatable type of stroke.[2] Incidence rates are particularly high in Asians and African-Americans compared to white population in united states and Europe and is associated with high mortality and morbidity than cerebral infarction or subarachnoid hemorrhage.[2-3] These changes are only partly explained by differences in educational attainment, socioeconomic status, and prevalence of vascular risk factors, such as hypertension, smoking, and alcohol consumption.[4-5]

BURDEN OF STROKE AND ICH

Stroke is the second leading cause of death worldwide and the main cause of long-term neurological disability in adults.[6] Globally, stroke remained the second-leading cause of death (11·6% [10·8–12·2] of total deaths) and the third-leading cause of death and disability combined (5·7% [5·1–6·2] of total deaths) in 2019. From 1990 to 2019, the absolute number of incident strokes increased by 70·0% (67·0–73·0), prevalent strokes increased by 85·0% (83·0–88·0), deaths from stroke increased by 43·0% (31·0–55·0), and deaths due to stroke increased by 32·0% (22·0–42·0).[7]

Burden of stroke occurrence, morbidity and mortality is much higher in developing nations compared to developed nations.[2-3] Mortality rate with ICH is as high as 32% to 50% of patients die within the first month and only 20% are independent at 6 months.[2-3]

Incidence markedly increases with age: from annual 1.9 cases per 100000 among people aged under 45 to 196.0 cases among those over 84.[8] Studies have shown 44.4 % of all ICH occur at age over 60, median age of ICH patients being 61, and incidence rates doubling every 10 years after age 35.[9-10-11] A few studies showed that incidence of ICH was higher in winter than summer.[12-13-14-15] Reason for this has remained unresolved, but climatic conditions acting as synchronizers to endogenous rhythms and thereby influencing periodic occurrence of pathological vascular events has been proposed as explanation.[13-14] Another possible reason blood pressure increases during colder months.[16]

The causes of ICH and clinical presentation has a myriad spectrum. ICH has a poor prognosis which is further influenced by various clinical and radiological factors. Various scores and parameters have been developed over time to predict prognosis and outcome of ICH including ICH Score, Spot sign score, ICH index, max ICH score, FUNC score. [17-21]

There is paucity of Indian literature on the utility of ICH scores in prognostication and outcome in patients with acute ICH as most of the literature on mortality and morbidity predictors in acute ICH is available from the developed nations.[11-12] [22-23]

Accurate prediction of outcome after acute ICH is necessary to distinguish those patients who need special care or who would benefit from particular therapeutic strategies. As present medical resources are limited and the demand for medical services is rapidly increasing, it is very important to identify patients who would benefit from aggressive treatment for proper utilization of resources and maximizing their cost effectiveness. Therefore, there is need to define a clinical grading scale for ICH which uses criteria that is predictive of outcome and that can be rapidly and accurately measured at the time of presentation to enable health care professionals to make robust and evidence based decisions in our country.

In this study; ICH score is being evaluated as a tool to predict immediate outcome during hospitalization and short term outcome after discharge to identify patients requiring special care to maintain their quality of life.

AIMS AND OBJECTIVES

- To study clinical profile of patients with acute intracerebral hemorrhage

- To evaluate the utility of ICH score as an outcome predictor in a resource-limited setting

REVIEW OF LITERATURE

Patients with ICH typically present with acute focal neurological deficits. In addition to specific neurological symptoms patients with ICH often have headache (36% versus 16% in IS) vomiting (29% versus 1-8% in IS), and decreased level of consciousness at admission (39% versus 13% in IS).[9] [24-25] After the initial symptom onset, progressive neurological deterioration can occur within minutes to hours.[18] [23] [26-27]

Elevation in blood pressure, often to very high levels, occurs in as many as 90% of patients with ICH.[22] In case of intracerebral hemorrhage blood pressure will increase in face of increased intracranial pressure (ICP) (Cushing response) to maintain cerebral perfusion pressure and systolic pressure may outgain diastolic pressure, creating a higher pulse pressure so pulse pressure may be a surrogate for increased intracranial pressure and is associated with fatal outcome.

Headache is more common in patients with large hematomas, and is attributed to traction on meningeal pain fibers, increased intracranial pressure, or blood in the cerebrospinal fluid. Small, deep hematomas are rarely associated with headache.

Vomiting is an important diagnostic sign, particularly if the hematoma lies within the cerebral hemisphere. Vomiting is common in patients with a stroke of any type in the posterior fossa.[23]

Seizures reported in about 10% of patients with ICH and about 50% of patients with lobar hemorrhage. Seizures typically occur at the onset of bleeding or within the first 24 hours.[28]

Patients with large ICH often have a decreased level of consciousness due to increased intracranial pressure and compression of the thalamus and brainstem. Stupor or coma indicates large ICHs that involve the brainstem reticular activating system.

RISK FACTORS

The risk factors for ICH can be classified as modifiable and non modifiable. Modifiable risk factors include hypertension, current smoking, excessive alcohol consumption, decreased Low-density lipoprotein cholesterol, low triglycerides, use of anticoagulants, use of antiplatelet agents, sympathomimetic drugs (Cocaine, heroin, amphetamine, PPA and ephedrine). Non modifiable risk factors include old age, male sex, asian ethnicity, cerebral amyloid angiopathy, cerebral microbleeds and chronic kidney disease.

The most important risk factor for ICH, as well as other stroke subtypes, is hypertension.[29-30-31] The severity and duration of hypertension have a clear correlation with the risk of ICH. Antihypertensive treatment in patients with hypertension decreases risk of stroke, including ICH.[32-33] Male gender and higher age have also been reported as risk factors for ICH.[29] [34] Age-related degenerative changes in cerebral arteries increase the risk for rupture, but also for ischemic stroke. Women are protected by estrogen, which reduces the risk of all detrimental cardiovascular insults, such as myocardial infarction and ischemic stroke. One reason for this is, estrogen having a protective effect against atherosclerosis by mediating transportation of cholesterol.[35-36]

Smoking is another important risk factor for ICH, ischemic stroke, and SAH, with gradual increase depending on how many cigarettes are smoked.[37-38] This association seems to be independent from hypertension, but most likely also resulting from atherosclerosis and structural damage to the arterial wall.

Excessive alcohol use (>60 mg/d) too increases risk of ICH, partially because of alcohol-induced hypertension but also independently, and most likely due to impaired coagulation, thrombocyte dysfunction, and directly affecting the integrity of cerebral vasculature.[39] Short-term moderate or heavy alcohol intake within 24 hours or one week (binge drinking) causes higher risk for ICH in comparison to long-term habitual

heavy drinking.[33]

CAUSES OF ICH

Spontaneous ICH is classified as either primary or secondary[40] Primary ICH is more common and may be due to two main arteriopathies- hypertension and cerebral amyloid angiopathy.[41-42] Other causes include use of antiplatelet agents, thrombolytics, anticoagulants particularly when the levels are above therapeutic levels, excess alcohol consumption, tumours, vascular malformation, drugs abuse (cocaine, heroin, amphetamines and cannabis) and inherited bleeding disorders. Cerebral reperfusion syndrome is a rare cause of ICH which can occur upto several weeks after revascularisation procedures including carotid endartrectomy and angioplasty or stenting.[43]

The locations for predisposition for hypertensive ICH is the putamen (46% of all ICH patients), thalamus (18%), caudate (4%), pons (13%), and cerebellum (4%)[44] whereas cerebral amyloidosis tends to occur in the lobar regions.

Deep ICH is defined as being centered within the basal ganglia, internal capsule, or thalamus. Ruptured vessels in primary ICH relating to hypertension most often occurs at or near the bifurcation of small penetrating arteries that originate from the basilar artery or the proximal anterior, middle, or posterior cerebral arteries.[28] [45-46] This is attributed to higher pressure in the arterial vessels adjacent to the Circle of Willis. [47]

The risk of recurrence of ICH is higher in cases associated with cerebral amyloid angiopathy (10-20% per year)[48] as compared to cases associated with hypertension (<2% per year, if hypertension is well controlled).[49] As a whole, independent of hemorrhage volume, cerebellar ICH was the highest predictor of 30-day mortality rate, considering the limited space in the posterior fossa and higher risk of herniation.

Due to their risk of bleeding, vascular structural anomalies are important causes of secondary ICH Including arteriovenous malformation (AVM), cavernous hemangioma, intracranial aneurysms, and Moyamoya disease,

they constitute approximately 5% of all ICH.[50-51]

Rupture of aneurysm causes 85% of SAHs, and also ICH may occur – mostly in cases with middle cerebral or distal anterior cerebral artery aneurysm. AVMs are vascular lesions, in which blood flows from arteries to veins without capillaries. They are most likely congenital but not hereditary, and their most common clinical presentation is ICH. The estimated annual rate of bleeding is between 2 to 3%.[52] Cavernous hemangiomas, another type of vascular malformation, have less blood flow, and usually cause epilepsy. They carry, however, annual risk of ICH of 1 to 2%.[53] Epithelioid hemangio-endotheliomas and capillary telangiectasias are rare structural causes of ICH.

Primary or metastatic intracranial neoplastic tumour may also bleed into brain parenchyma.

Oral anticoagulation (OAC) associates nearly 20% of all ICHs, having markedly increased since 1990s as a result of increasing use of OAC to prevent ischemic events in patients with atrial fibrillation.[54] Most episodes of OAC-caused ICH often occur during international normalized ratio (INR) being between 2.0 and 3.5.[55] OAC use is associated with larger initial hematomas, hematoma expansion, and neurological deterioration in the first 24 to 48 hours.[56] OAC-related ICH is more often lobar than deep. Novel oral anticoagulants have substantially lower risk of ICH in comparison to traditional OAC.[57] Other acquired coagulopathies include those related to liver diseases, such as liver cirrhosis, due to the decreased production of clotting factors I (fibrinogen), II (prothrombin), V, VII, VIII, IX, X, and XI. Rarely ICH may also be caused by hereditary coagulopathies, such as von Willebrand's disease, or malignant hematological diseases, such as leukemia or polycythemia vera.

Iatrogenic etiologies include carotid endarterectomy and heparin. National Institute of Neurological Disorders and Stroke has reported that the overall risk of ICH after use of tissue plasminogen activator for ischemic stroke is 6.4%.[58]

Eclampsia acutely raises blood pressure, and by the same mechanism, or by reversible cerebral vasoconstriction syndrome (RCVS). Pheochromocytoma, glomerulonephritis, and strenuous physical activity, may also cause ICH.[59-60] In all of these cases, hemorrhage is caused by pathologic circumstances in brain circulation and parenchyma. Finally, illicit drugs, such as amphetamine or cocaine, may also cause ICH by RVCS or necrotizing angiitis. One case has also been reported of ICH associated with ephedrine abuse[61]

TYPES OF INTRACEREBRAL HEMORRHAGE

1. Putaminal hemorrhage

This is the most common site of hypertensive bleed, and the adjacent internal capsule is usually damaged. Contralateral hemiparesis is therefore the sentinel sign. When hemorrhage is large, drowsiness gives way to coma, a dilated pupil and fixed ipsilateral pupil, and decerebrate rigidity.

2. Thalamic hemorrhage

They produce a contralateral hemiparesis due to extension into the adjacent internal capsule. A prominent sensory deficit involving all the sensory modalities is usually present. Thalamic hemorrhage, by virtue of its extension into the subthalamus and high midbrain, may cause a series of ocular disturbances.

3. Pontine hemorrhage

Here deep coma usually ensues in a few minutes, and the clinical picture is dominated by total paralysis, decerebrate rigidity, and small (1-mm) pupils that react to light. Lateral eye movements, evoked by head turning or caloric testing, are impaired or absent. Death usually occurs within a few hours, but there are rare exceptions in which consciousness is retained and the clinical manifestations indicate a smaller lesion in the tegmentum of the pons.

4. Cerebellar hemorrhage

Repeated vomiting is a prominent feature, along with occipital headache, vertigo, and inability to sit, stand, or walk. In the early phase of the illness, other clinical signs of cerebellar disease may be minimal or lacking; only a minority of cases show nystagmus or cerebellar ataxia of the limbs, although these signs must always be sought. Dysarthria and dysphagia may be prominent in some cases but usually absent. Patients with vermian clots and hydrocephalus are at the highest risk for rapid deterioration. As the hours pass, and occasionally with unanticipated suddenness, the patient becomes stuporous and then comatose or suddenly apneic as a result of brainstem compression, at which point reversal of the syndrome, even by surgical therapy, is seldom successful.

5. Caudate hemorrhage

The most common clinical presentations are severe headache, nausea, vomiting, and signs of marked meningeal irritation, mimicking a SAH or primary IVH. These patients show no prominent motor, sensory, or visual abnormalities the parenchymal hematoma itself does not require surgical intervention but emergency extraventricular drainage may be required when acute hydrocephalus develops.

6. Lobar hemorrhage

Bleeding in areas other than those listed above, specifically in the subcortical white matter of one of the lobes of the cerebral hemisphere, is not associated strictly with hypertension. Any number of other causes are usually responsible, the main ones being anticoagulation or thrombolytic therapy, acquired coagulopathies, cranial trauma, arteriovenous malformation, trauma, and, in the elderly, amyloidosis of the cerebral vessels. Amyloid angiopathy is an important cause of lobar hemorrhage in the elderly patients.

OUTCOME OF ICH

ICH is a devastating stroke, with a fatality of approximately 40% in the first

month.[45] Up to half of deaths following ICH occur within the first two days after onset.[62] Only 12 to 39% of survivors achieve functional independence at 6-months.[63-64] Significant determinants of mortality at 30 days include age>80 years, ICH volume, infratentorial location of hematoma, hydrocephalus, Glasgow coma scale, and presence of intraventricular hemorrhage (IVH).[65]

DIAGNOSIS

Current guidelines recommend that brain imaging should be undertaken as soon as possible but immediately (within 1 hour) if any of the following apply:

- Indications for thrombolysis or early anticoagulation
- Decreased level of consciousness
- Unexplained progressive or fluctuant symptoms
- On anticoagulants or known bleeding disorder
- Papilloedema, neck stiffness or fever
- Severe headache at onset of symptoms[66-67]

Even in those patients without these indications, immediate scanning improves outcomes and has shown to be cost effective.[66] In patients with TIA, brain imaging should be performed if the vascular territory or pathology is not clear.[68] Scanning, preferably diffusion-weighted MRI should be done urgently in 'high risk' patients with an ABCD2 score of 4 or more, or with two or more TIA's in a week.[68] Computed Tomography (CT) or Magnetic Resonance Imaging (MRI) is vital to differentiate between ischemic and hemorrhagic stroke since treatment differs for the two types.[66] The posterior fossa of the brain is better visualized on MRI scan and in such patients, the imaging of choice.[69] MRI identifies a broader range of acute and chronic cerebrovascular pathologies such as anatomy, cerebral blood flow, perfusion, old or new lesions and hence, may replace CT in the future to aid decisions about acute intervention and further management.[70]

PREDICTORS OF PROGNOSIS

Clinical grading scales are important in management of neurological conditions. They help in prognostication, treatment selection and communication. Examples of widely used clinical grading scales include the GCS for traumatic brain injury (and other disorders), the Hunt-Hess and World Federation of Neurological Surgeons (WFNS) scales for aneurysmal SAH, the National Institutes of Health Stroke

Scale (NIHSS) for ischemic stroke, and the Spetzler-Martin scale for arteriovenous malformations.[71-74] Several prognostic models were developed for prognosis of ICH. These identified level of consciousness, hematoma volume, presence of IVH predictors of outcome and mortality.[22][75-76]

The ICH score is a 6-point calculation based on five clinical indicators:

1. Age >= 80 years
2. Glasgow coma scale (GCS)
3. Volume of hematoma on baseline CT scan
4. Location (infratentorial or supratentorial)
5. Presence of intra-ventricular extension

Each parameter is given a score from 0 to 1; except GCS which ranges from 0 to 2.

a. Age >= 80 years: yes=1, no= 0.

b. Glasgow coma scale (GCS): GCS score 3 to 4 (= 2 points); GCS score 5 to 12 (=1); GCS score 13 to 15 (=0).

c. Volume of hematoma on baseline CT scan of brain: ICH volume >= 30 cm3 (=1); ICH volume ≤ 30 cm3 (=0) by ABC/2 formula.[77] ABC/2 formula: A is the greatest diameter on the largest hemorrhage slice, B is the diameter perpendicular to A, and C is the approximate number of axial slices with hemorrhage multiplied by the slice thickness.[78]

d. Location of hematoma (infratentorial or supratentorial): infratentorial origin (yes=1) (no=0).

e. Presence of intraventricular extension: yes =1; no= 0.

Mass effect quantified according to whether or not there is compression of surrounding structures and mid line shift of the pineal or septum pellucidum.

• Score ranges from 0 to 6

• As the score increases from 0 to 6, it indicates worsening in the outcome.

GCS is a reliable, reproducible standard neurological tool. The GCS component of the ICH Score is divided into 3, not 2, subgroups. Most other prediction models have grouped patients into those with GCS score >8 versus those ≤8.

Age has been found to be an independent predictor of ICH outcome in some prior prediction models, while age has not been associated with outcome in others.[22] [75] [79] In the UCSF ICH cohort, only very old age (≥80 years) was associated with 30-day mortality.[80]

ICH volume is associated with outcome in ICH.[75-76] Small hematomas are defined as less than 30 cm^3 and large hematoma are defined as more than 60 cm^3.[75] [77] However it has been found that ICH Volume is not an independent predictor for infratentorial hemorrhages because location is found to be more important for predicting outcome.

Disability status of survivors (morbidity) can be assessed using Modified Rankin Scale (mRS). Modified rank in scale is a clinician reported global disability scale.[81-82]

MODIFIED RANKIN SCALE (mRS)

The scale runs from 0-6, running from perfect health without symptoms to death

0 - No symptoms.

1- No significant disability. Able to carry out all usual activities, despite some symptoms.

2- Slight disability. Able to look after own affairs without assistance, but unable to carry out all previous activities.

3- Moderate disability. Requires some help, but able to walk unassisted.

4- Moderately severe disability. Unable to attend to own bodily needs without assistance, and unable to walk unassisted.

5-Severe disability. Requires constant nursing care and attention, bedridden, incontinent.

6-Dead

Other isolated factors have been found to be associated with worse outcome. These include fever at presentation, diabetes mellitus, hypertension, neutrophil/lymphocyte ratio more than 6.5.[83-86]

Hyperglycemia may aggravate brain edema and increase neural cell death.[85] [87]

Use of antiplatelet and anticoagulants prior to ICH has also been associated with poor prognosis.[88-89]

CKD has been associated with increased mortality secondary to platelet dysfunction, electrolyte imbalance and higher blood pressure and lastly by endothelial damage and arteriosclerosis.[90-92] Low eGFR at baseline was associated with an increased risk of in-hospital mortality, non-routine discharge, hemorrhagic stroke severity and in-hospital complications such as pneumonia, hydrocephalus and hematoma evacuation in acute ICH patients.[93]

Rohit Bhatia et al. studied factors associated with in hospital mortality in patients with ICH, the disability status of patients by modified Rankin Scale (mRS) at the time of discharge and concluded that low GCS, higher baseline hematoma volume, presence of Intraventricular hemorrhage and need for ventilatory assistance are independent predictors of mortality. Surgery did not improve mortality or outcome and most of the survivors

were significantly disabled at discharge.[2]

Piyush Ojha et al. concluded that ICH score is a useful tool to predict outcome during hospitalization, on discharge, 1 month and 2 month follow up. The independent predictors of increased mortality are presence of vomiting, seizures, loss of consciousness, lower GCS (<=8), higher ICH score and ventilatory requirement. Statistically significant radiological features associated with mortality include infratentorial location, presence of hydrocephalus, higher midline shift, intraventricular extension of hematoma and a higher baseline hematoma volume. ICH score assessment and documentation should become standard procedure in acute care and follow up of patients with intracerebral hemorrhage.[3]

Stanley Tuhrim et al. studied factors predictive of 30-day outcome after ICH and concluded that the nine univariate factors statistically associated with outcome were GCS score, systolic blood pressure, pulse pressure, horizontal and vertical gaze palsies, severity of weakness, presence of brainstem-cerebellar deficits, interval stroke course and parenchymal hemorrhage size. After using step down variable selection procedure a logistic regression model was obtained containing only GCS score, hemorrhage size and pulse pressure to correctly categorize 92% of the patients alive or dead at 30 days after onset of ICH.[22]

Stanley Tuhrim et al. previously reported logistic regression model for predicting 30-day survival after spontaneous ICH. Two factors not collected previously - hyperglycemia and intraventricular hemorrhage extension were assessed and intraventricular hemorrhage extension contributed significant predictive information in a logistic regression, whereas hyperglycemia did not. And the resulting four factor model (GCS score, hemorrhage size, pulse pressure and intraventricular hemorrhage extension) correctly classified the survival status of 94% of patients at 30 days.[22]

P Daverat et al. assessed death and functional outcome after 6 months of spontaneous intracerebral hemorrhage and found that five independent

predictors of outcome at 6 months are age, hemorrhage size, intraventricular spread of the hemorrhage, limb paresis and communication disorders. Of these, age was the most important predictor.[63]

J P Broderick et al. studied powerful and easy to use predictor of 30-day mortality after ICH and concluded that volume of intracerebral hemorrhage was the strongest predictor of 30-day mortality for all locations of ICH. Using three categories of parenchymal hemorrhage volume (0 to 29 cm3, 30 to 60 cm3, and 61 cm3 or more), calculated by a quick and easy to use ellipsoid method, and two categories of the GCS scale (9 or more and 8 or less), 30 day mortality was predicted correctly with a sensitivity of 96% and a specificity of 98%. Patients with a parenchymal hemorrhage volume of 60cm3 or more on their initial CT and a GCS score of 8 or less had a predicted mortality of 91%. Patients with a volume of less than 30 cm3 and a GCS score of 9 or more had a predicted 30-day mortality of 19%. So volume of intracerebral hemorrhage, in combination with the initial GCS scale score, is a powerful and easy to use predictor of 30-day mortality and morbidity in patients with spontaneous ICH.[75]

Seppo juvela et al. concluded that in addition to severity and location of hemorrhage, the age of the patient and amount of alcohol consumed within 1 week seem to be independent determinants of outcome after intracerebral hemorrhage.[79]

M. Arfan Ikram et al. concluded that intracerebral hemorrhage is a multi-factorial disease caused by several interacting and overlapping risk factors and etiologies. Hypertension remains the most important risk factor followed by cerebral amyloid angiopathy. However, the increased use of anticoagulants poses new challenges to better prevent intracerebral hemorrhage as complication. Beside hypertension other risk factors for intracerebral hemorrhage are smoking, alcohol and diabetes mellitus.[94]

Jose L. Ruiz- Sandoval et al. used all the components of ICH score (age, Glasgow coma scale, ICH location, ICH volume and intraventricular

extension) with different cut offs and concluded that compared with the ICH score, ICH-GS explained more variance in the outcome measures, had higher sensitivity in predicting in-hospital and 30-day mortality, and performed equally well in predicting good functional outcome at 30 days follow up. Moreover, ICH-GS had higher accuracy than the ICH score in predicting mortality and good functional outcome. Factors associated with mortality were age 65 or more years, GCS at hospital admission less than 8, ICH volume more than 70ml, irruption into the ventricular system, and infratentorial location of the hematoma.[95]

Ya- Ching Chuang et al. concluded that the accuracy of sICH score was 80.5%, the sensitivity was 82.5% and the specificity was 80.2%. The AUCs are: sICH score, 0.89 (0.89-0.94); ICH score, 0.74 (0.65-0.83) and ICH-GS, 0.74 (0.65-0.83). The sICH score is a very suitable model for risk stratification for predicting 30-Day mortality of intracerebral hemorrhage. Also it can permit standardization of assessment and prognostication.[6]

J. Claude Hemphill III et al. concluded that the ICH score is a simple clinical grading scale that allows risk stratification on presentation with ICH. The use of a scale such as the ICH score could improve standardization of clinical treatment protocols and clinical research studies in ICH.[96]

Aimee M. Aysenne et al. concluded that ICH score calculated 24 hours after admission is a better predictor of mortality than the ICH score calculated on admission. Early determination of the ICH score may incorrectly estimate the severity and expected outcome after ICH. Due to dynamic nature of ICH with high risk of hematoma expansion, new IVH, decreasing level of consciousness and delayed measure of the ICH score (24-hour ICH score) is better outcomes predictor.[97]

Russell K Portenoy et al. concluded that low GCS score, coma, ataxic respiration, abnormal pupils, acute hypertension, large hemorrhage size and intraventricular extension of blood were associated with poor outcome. Multivariate analysis using logistic regression identified three

variables, the GCS score, hemorrhage size and intraventricular hemorrhage extension of blood most predictive of outcome.[98]

Michal A. Douglas at al. studied long term prognosis of hypertensive intracerebral hemorrhage and concluded that the status of alertness, EKG and clinical impression on admission were significant prognostic factors. Mortality increased with size of hematoma and ventricular rupture. Acute in hospital mortality was 40%. 45% of the survivors were fully ambulatory and another 31% ambulatory with assistance after almost 3 years. 17% died during the follow up period. Most patients' functions remained the same at follow up as it had been at discharge from the initial hospitalization. So the patients who have survived a primary (hypertensive) ICH have a relatively good prognosis for recovery of function. Hypertensive intracerebral hemorrhages, unlike aneurysms, rarely, if ever, rebleed. Patients are not likely to have a second bleed in another location. Hypertensive intracerebral hemorrhage is more common in black, especially young adult males with severe hypertension, but overall mortality is lower than thought prior to the CT scan. Most survivors can achieve independence and deserve aggressive medical care and rehabilitation efforts.[99]

S.E. Vermeer et al. concluded that patients who recovered from a primary intracerebral hemorrhage had a 2.1% to 5.9% annual rate of recurrence, vascular death, or vascular events. Age of 65 years or older more than doubled the risk of recurrence, vascular event or death and the risk of vascular events in men was increased twofold.[100]

Matthew L. Flaherty et al. concluded that the incidence rates of ICH are known to be higher in American blacks than whites possibly due to excess of hemorrhages in young and middle-aged persons particularly for deep cerebral and brain stem locations. The most plausible explanation for this difference is variation in the prevalence and treatment of hypertension, although other risk factors may contribute. [101]

In a landmark study by Brott et al. any degree of hematoma expansion

within the first 24 hours after presentation was shown to occur in up to 73% of patients presenting within 3 hours of onset.[102] Hematoma growth has been shown to be associated with early neurological decline within the first 24-48 hours and poor long-term outcomes.[26] [103] In the study by Brott et al, 103 patients with ICH who presented within 3 hours of symptom onset underwent head CT scans at baseline, 1 hour later, and at 20 hours 27 26% of patients had an increase in hematoma volume ≥33% within 1 hour of the baseline CT and an additional 12% of patients exhibited further expansion within the subsequent 20 hours, indicating that hematoma expansion is time-dependent. Expansion was associated with neurological deterioration, as measured by the Glasgow Coma Scale (GCS) and NIH Stroke Scale (NIHSS).[102]

The Full Outline of Unresponsiveness (FOUR) Score is a validated scale describing the essentials of a coma examination, including motor response, eye opening and eye movements, brainstem reflexes, and respiratory pattern. Braksick et al Incorporated FOUR score into ICH as a substitute for the GCS (ICH Score). The ability of the 2 scores to predict mortality at 1 month was then compared. The ICH Score and the ICH $Score_{FS}$ predict ED 1-month mortality with comparable accuracy. As the FOUR Score provides additional clinical information regarding patient status, it was considered a reasonable substitute for the GCS into the ICH Score.[104]

The intracerebral hemorrhage (ICH) score is a widely acceptable prognostic score used to estimate 30-day mortality in ICH. The validity of the score was obtained in a group probably not using oral anticoagulants (OACs). Fakiri et al did a retrospective study to analyze the utility of the ICH score for predicting the 30-day mortality rate in the full range of ICH scores in patients using OACs. 1752 patients were included of which 462 (26%) patients were on OAC. The 30-day mortality was 54% for the OAC cohort and 34% for the OAC-naive cohort. The 30-day mortality was higher in the OAC cohort for ICH score 1 (33% vs. 12.5%; odds ratio, 3.4;

95% confidence intervals, 1.1–10.4) and ICH score 2 (53% vs. 26%; odds ratio, 3.2; 95% confidence intervals, 1.2–8.2) compared with the predicted mortality rate of the original ICH score. Overall, the discriminative ability of the ICH score was equally good in both cohorts (area under the curve 0.83 vs. 0.87, respectively). It was found that The ICH score underestimated the 30-day mortality rate for lower ICH scores in OAC-ICH.[105]

Masotti et al included 170 patients in a retrospective study of which 67 were on antiplatelet, 33 were on vitamin K antagonists and 66 were on neither. In-hospital mortality was 35.8% and significantly higher in patients on vitamin K antagonists (59.4%) or on antiplatelet agents (41.7%) than in those who were not on these medications (20.6%; p=0.0001 for trend)). Median ICH SCORE was 2 in patients with vitamin K antagonists, 2 for patients on antiplatelet agents, and 1 for non-treated patients. The intracerebral hemorrhage score predicted in-hospital mortality in all three subgroups accurately. However, patients on vitamin K antagonists and antiplatelet agents showed significantly higher mortality rates at intracerebral hemorrhage score ≤3, compared to non-treated patients (39%, 28.3% and 10%, respectively). Thus ICH Score has good predictive value in patients on or off antithrombotic agents. However, for scores ≤ 3, the intracerebral hemorrhage score significantly underestimates in-hospital mortality in patients on antithrombotic agents.[106]

Intraventricular hemorrhage (IVH) is caused by the hemorrhage rupturing into the ventricles and is an important predictor of outcome, Patients with IVH are twice as likely to have poor outcomes (a modified Rankin scale [mRS] score of 4–6 at hospital discharge) and nearly three times more likely to die than their cohorts without IVH.[107] The burden of white matter lesion (WML) or leukoariaosis has been identified as a predictor of worse ICH outcomes.[108]

Vagal et al. included population from two large ICH studies; the Genetic and Environmental Risk Factors for Hemorrhagic Stroke (GERFHS III) Study and the Ethnic/Racial Variations of Intracerebral Hemorrhage

(ERICH) Study. WML lesions were graded using the Van Swieten Scale (0-1 for mild, 2 for moderate, and 3-4 for severe WML) and presence or absence of IVH in baseline CT scans. Out of total of 3023 ICH patients, 1260 (41.7%) had presence of IVH. In patients with IVH, the proportion of severe WML (28.6%) was higher compared with patients without IVH (21.8%) ($p<0.0001$). it was found that moderate-severe WML, deep ICH, and increasing ICH volume were independently associated with presence of IVH. An increased risk of IVH was found with moderate-severe WML (OR=1.38; 95% Cl 1.03-1.86, p = 0.0328) in the subset of lobar hemorrhages.[109]

Loan et al observed in a community cohort study that Total volume of intracerebral hemorrhage and peri-hematomal edema, and intracerebral hemorrhage volume alone on diagnostic brain CT, at three days or sooner, are independently associated with death or dependence one-year after intracerebral hemorrhage, but peri-hematomal edema volume is not.[110]

Most researches on ICH have focussed on outcomes with respect to short-term mortality (within 6 months). However Banerjee et al found that not all baseline factors associated with early mortality after ICH are associated with mortality after 6 months. The study defined early death as one occurring within 6 months of the index hemorrhage event and late as one that occurred after 6 months and within 3 years of the index ICH. Early death was associated with age, hypertension, diabetes mellitus, atrial fibrillation, a history of previous cerebral ischemic events, pre-event modified Rankin scale (mRS) score, anticoagulant use prior to ICH, Glasgow Coma Scale (GCS) and National Institutes of Health Stroke Scale (NIHSS) scores at study entry.

When considering death later than 6 months age, atrial fibrillation, smoking, pre-event cognitive impairment, previous cerebral ischemic event, pre-event mRS score, anticoagulant use prior to index ICH, increasing van Swieten score and the presence of intraventricular extension showed significant associations. Exploratory analyses was done

where time was considered as a continuous measure to find time varying effects of these factors. The HRs of previous cerebral ischemic events increased with time, whereas those for NIHSS score and ICH volume decreased with time. The protective (negative association) of GCS score also decreased with time. Thus whereas GCS score, NIHSS score and ICH volume are important predictors of early mortality, their effect changes significantly between the early and late periods, and thus they are less useful for predicting mortality in the longer term. [111]

Deng et al found that on ct HVD ≤ 2.5 mm was associated with increased odds of clinical poor outcome. Youden index was used to evaluate the cutoff of HVD predicting functional outcome. Logistic regression model was used to assess the HVD data and clinical poor outcome (modified Rankin Scale 4–6) at 90 days. They found that IVH was an independent predictor of poor outcome in univariate analysis. However IVH was not found to be an independent predictor of poor clinical outcome in multivariate model (p = 0.139). HVD ≤ 2.5 mm remained an independent predictor of poor outcome in the multivariable logistic regression model, suggesting that HVD ≤ 2.5 mm is a more robust outcome parameter than IVH presence. They also showed that HVD ≤ 2.5 mm had relatively high sensitivity for predicting poor outcome. [112]

Hematoma growth (HG), which occurs mainly during the first 6 h, has been shown to be an independent determinant of early deterioration, death and disability in patients with ICH.[113] because there are varying velocities of expansion, hematoma growth may be markedly nonlinear and the speed of the hematoma expansion cannot be calculated accurately. The impact of initial ICH volume on outcome may vary widely depending on the time from symptom onset to baseline CT scan [onset-to-imaging time (OIT), even in patients within 6 h of onset. Therefore, the adjustment of initial ICH volume by OIT may improve the accuracy to predict clinical outcomes. The uHG is the average rate of hematoma expansion before baseline CT scan. It is calculated as the baseline hematoma volume (ml) divided by OIT

(hours). It was found to be a predictor of poor clinical outcomes in patients with acute ICH.[114] In a study by Wang WJ et al it was also found to be a useful predictor of in-hospital mortality, 90-day, and 1-year poor outcome after acute ICH.

MATERIAL AND METHODS

Source of Data

Patients admitted in medical ward and/or neurology ward and/or intensive care units of medicine and other allied specialties and/or emergency in Dayanand Medical College and Hospital. This is a prospective observational study designed to study the clinical profile of admitted patient with acute intracerebral hemorrhage (ICH) and to evaluate the utility of ICH score as an outcome predictor.

METHOD OF COLLECTION OF DATA

Inclusion Criteria

1. Age > 18 years
2. Patients with acute Intracerebral hemorrhage

Exclusion Criteria

1. History of trauma
2. Patients who denied informed consent

DURATION OF STUDY

From 1st Jan 2020 to 31st May 2021 or 100 patients; whichever is earlier.

OUTCOME

The following variables will be evaluated:

- Clinical/laboratory/radiological/treatment profile of patients
- ICH Score at presentation
- Length of stay in hospital (intensive care unit and/or ward)
- Neurosurgical Intervention(s); if any
- Details of pre-admission workup and treatment outside; wherever available
- At discharge: Morbidity outcome (disability status of survivors) using Modified Rankin Scale (mRS)
- Follow-up: Patient or caregiver will be followed up at 30 days and 60 days using mRS in-person or telephonically; wherever feasible

OBSERVATIONS AND RESULTS

A total of consenting 100 patients having ICH were enrolled in the study.

AGE

The age of the patients admitted with acute hemorrhagic stroke in our study ranged from 17 years to 99 years with a mean of 55.19 years. Most common age group between 51-70 years comprised 39% of the patients. The mean age of male patients in our study was 55.43 years and that of female patients was 54.69 Years

Table 1: Age distribution of patients with acute hemorrhagic stroke

Age group	No. of cases	Percentage
≤ 30	7	7.0%
31-50	35	35.0%
51-70	39	39.0%
> 70	19	19.0%
Total	100	100.0%

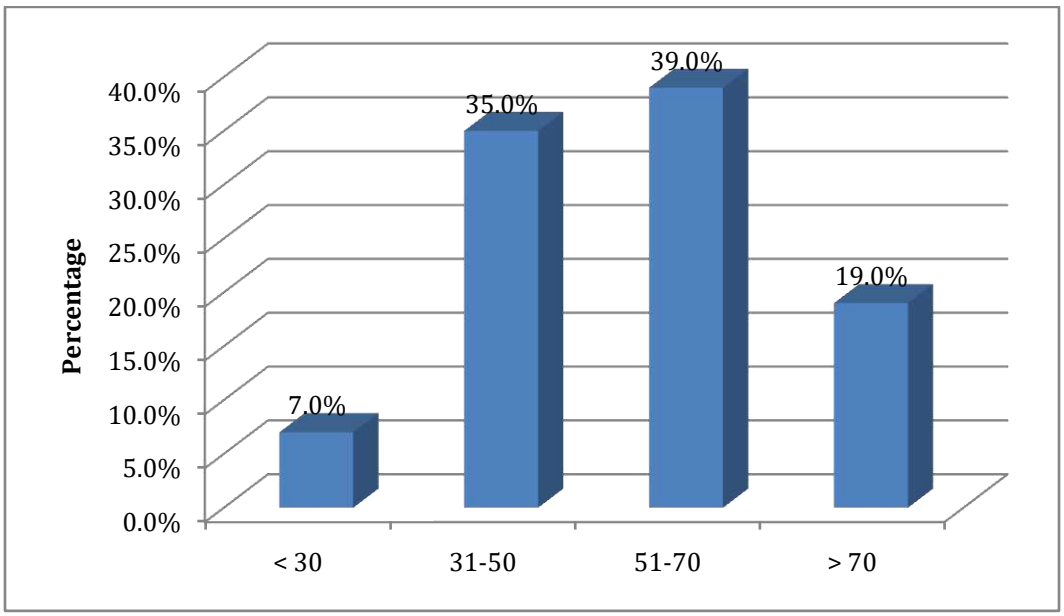


Figure 1: Age distribution of patients with acute hemorrhagic stroke

Table 2: Influence of age on outcome of hemorrhagic stroke as assessed by mRS at the time of discharge from the hospital:

		mRS- group						Total	p-value
		≤ 3		4-5		6			
Age group	≤ 30	1	14.3%	6	85.7%	0	0.0%	7	0.62
	31-50	5	14.3%	28	80.0%	2	5.7%	35	
	51-70	6	15.4%	33	84.6%	0	0.0%	39	
	> 70	2	10.5%	15	78.9%	2	10.5%	19	
Total		14		82		4		100	

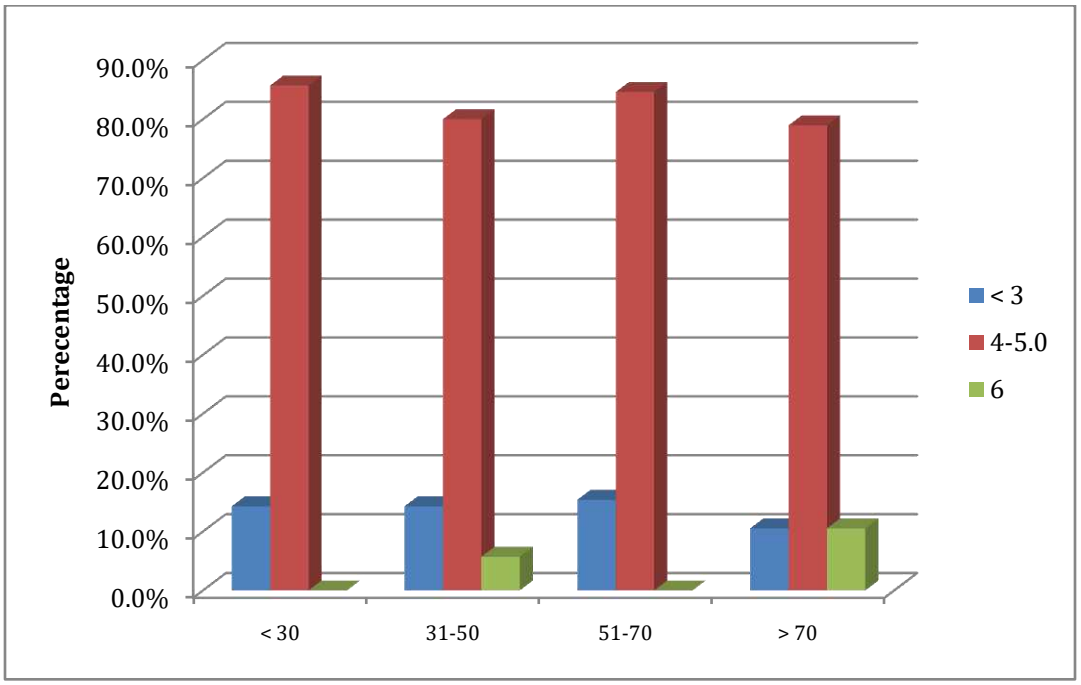


Figure 2: Influence of age on outcome of hemorrhagic stroke as assessed by mRS at the time of discharge from the hospital:

In our study, 7 patients of less than 30 years were present and 1 (14.3%) had mRS score ≤3 and remaining 6 (85.7%) had mRS score between 4-5 with no mortality at the time of discharge from the hospital.

Between 31-50 years, of total 35 patients, 5 (14.3%) had mRS score ≤3, 28 (80%) had score between 4-5 and remaining 2 (5.7%) died during the course of hospital stay (mRS 6).

Between 51- 70 years, of total 39 patients, 6 (15.4%) had mRS score ≤3, 33 (84.6%) had score between 4-5 and no mortality was there at the time of discharge.

More than 70 years among 19 patients, 2 (10.5%) had mRS score ≤3, 15 (78.9%) had score between 4-5, and remaining 2 patients (10.5%) died during the course of hospital stay.

Maximum mortality was seen in age group more than 70 years but p value is 0.62, so the influence of age on outcome of hemorrhagic stroke (as assessed by modified rankin score (mRS)) at discharge is not statistically significant.

Table 3: Influence of age on outcome of hemorrhagic stroke as assessed by mRS at 60 days follow-up

		mRS- group 60 days						Total	p-value
		≤ 3		4-5		6			
Age group	≤ 30	1	14.3%	5	71.4%	1	14.3%	7	0.834
	31-50	10	28.6%	19	54.3%	6	17.1%	35	
	51-70	10	25.6%	22	56.4%	7	17.9%	39	
	> 70	4	21.1%	9	47.4%	6	31.6%	19	
Total		25		55		20		100	

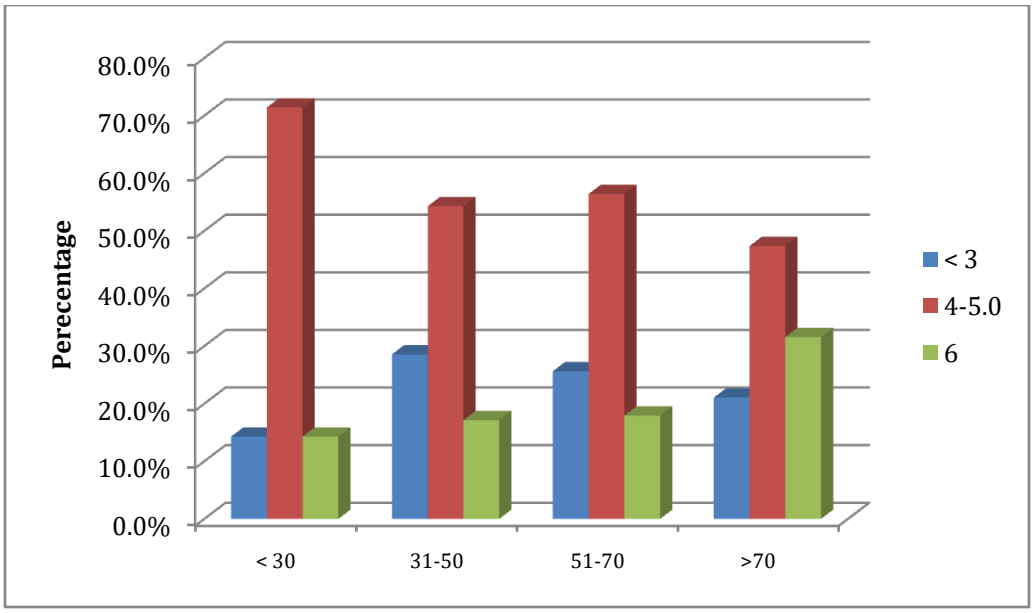


Figure 3: Influence of age on outcome of hemorrhagic stroke as assessed by mRS at 60 days follow up

Of total 7 patients less than 30 years, 1 (14.3%) had mRS score ≤3, 5 patients (71.4%) had score between 4-5 and 1 patient (14.3%) died at the end of 60 days (mRS 6).

Between 31-50 years, of total 35 patients, 10 (28.6%) had mRS score ≤3, 19 (54.3%) had score between 4-5 and remaining 6 patients (17.1%) died at the end of 60 days (mRS 6).

Between 51- 70 years, of total 39 patients, 10 (25.6%) had mRS score ≤3, 22 (56.4%) had score between 4-5 and remaining 7 patients (17.9%) died at the end of 60 days.

More than 70 years among 19 patients, 4 (21.1%) had mRS score ≤3, 9 (47.4%) had score between 4-5, and 6 patients (31.6%) died at the end of 60 days.

In our study mortality increased with increasing age with maximum mortality seen in age group more than 70 years (31.6%) followed by age group between 51-70 years (17.9%). However, P value of 0.834 indicates that the association between age and outcome in hemorrhagic stroke (as assessed by modified rankin score (mRS) at the end of 60 days is not statistically significant.

GENDER

In our study group, 68(68%) were males and 32(32%) were females translating into male: female ratio of 2.1:1.

Table 4: Gender distribution of patients with acute hemorrhagic stroke

Gender	No. of cases	Percentage
Female	32	32.0%
Male	68	68.0%
Total	100	100.0%

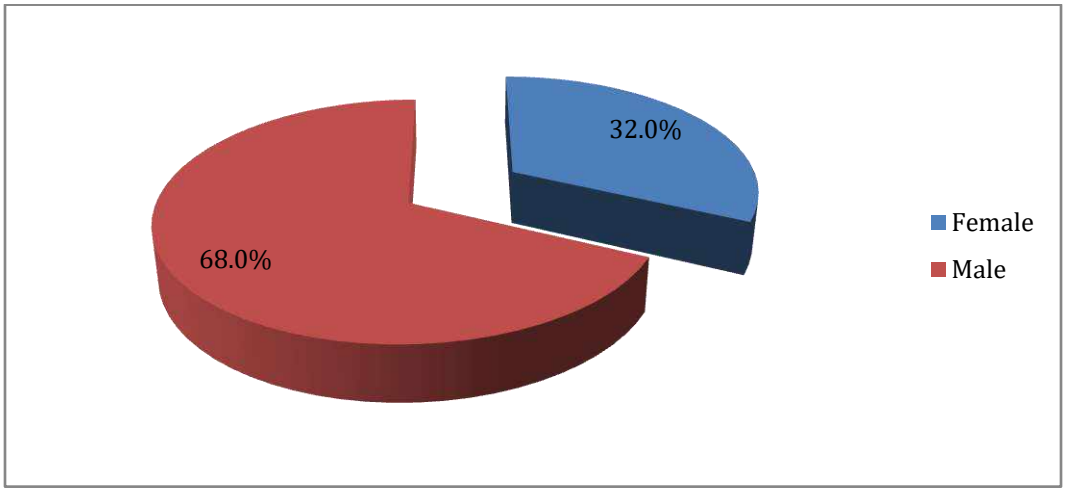


Figure 4: Gender distribution of patients with acute hemorrhagic stroke

Table 5: Gender distribution in various age groups

		Gender				Total	Chi-square value	p-value
		Female		Male				
Age group	< 30	2	6%	5	7%	7	0.436	0.933
	31-50	12	37%	23	34%	35		
	51-70	13	41%	26	38%	39		
	> 70	5	16%	14	21%	19		
Total		32	100%	68	100%	100		

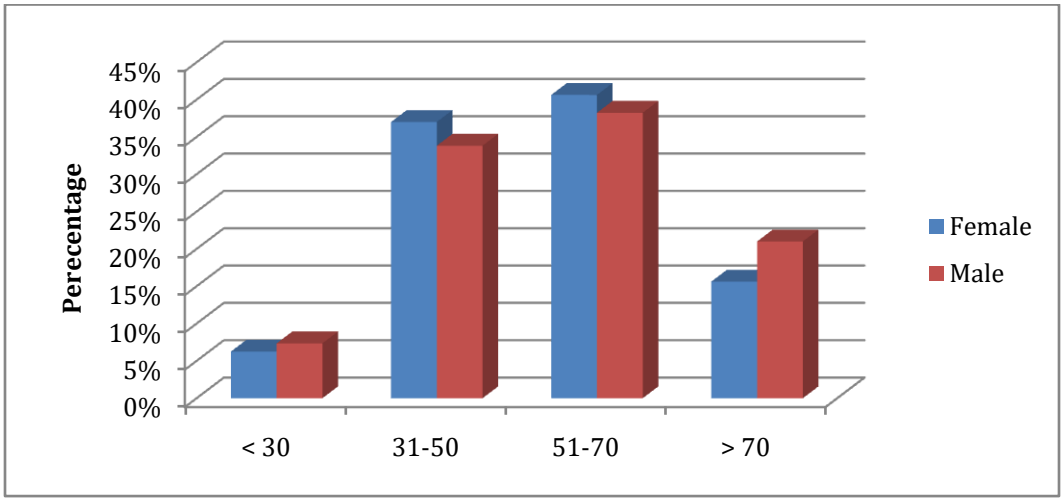


Figure 5: Gender distribution in various age groups

Among 32 females, 2 (6%) had age less than 30 years, 12 females (37%) had between 31-50 years, 13 (41%) had between 51-70 years and 5 females (16%) were more than 70 years.

Among 68 males 5 (7%) had age less than 30 years, 23 (34%) had between 31-50 years, 26 (38%) had between 51-70 years and remaining 14 males (21%) were more than 70 years.

Maximum males and females were between age group 51-70 years- the most common age group of our study.

Table 6: Influence of gender on outcome of hemorrhagic stroke asassessed by mRS at discharge, 30 days and 60 days follow u

		Gender				Total	Chi-square value	p-value
		Female		Male				
mRS- group at discharge	≤ 3	6	19%	8	12%	14	1.635	0.441
	4-5	24	75%	58	85%	82		
	6	2	6%	2	3%	4		
mRS- group 30 days	≤ 3	6	19%	11	16%	17	0.266	0.876
	4-5	19	59%	44	65%	63		
	6	7	22%	13	19%	20		
mRS- group 60 days	≤ 3	7	22%	18	27%	25	0.280	0.869
	4-5	18	56%	37	54%	55		
	6	7	22%	13	19%	20		
Total		32	100%	68	100%	100		

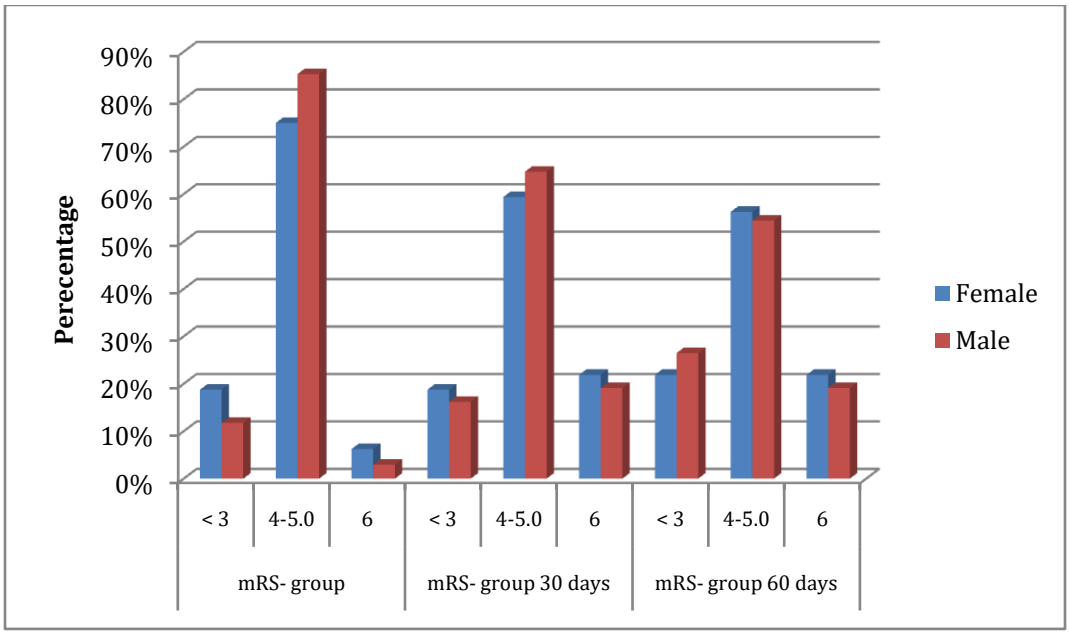


Figure 6: Influence of gender on outcome of hemorrhagic stroke as assessed by mRS at discharge, 30 days and 60 days follow up

Out of 68 males in our study, at discharge from the hospital, 8 (12%) had mRS score ≤3, 58 (85%) had score between 4-5 (bed bound) and 2 males (3%) died during the course of the hospital stay. Among 32 females, at discharge from the hospital, 6 (19%) had mRS score ≤3, 24 (75%) had score between 4-5 (bed bound) and 2 females (6%) died during the course of the hospital stay.

At 30 days follow up, males with mRS score ≤3 were 11 (16%), score between 4-5 (bed bound) were 44 (65%) and 13 males (19%) died at the end of 30 days. Among females, 6 (19%) had mRS score≤3, 19 (59%) had score between 4-5 (bed bound) and 7 (22%) died at the end of 30 days.

At 60 days follow up, 18 (27%) males were with mRS score ≤3, 37 (54%) had score between 4-5 (bed bound) and 13 males (19%) died at the end of 60 days. Among females, 7 (22%) had mRS score ≤3, 18 (56%) had score between 4-5 (bed bound) and 7 females (22%) died at the end of 60 days.

In our study females had higher risk of mortality than males each at discharge, 30 and 60 days follow up but p value is more than 0.05, so the association between gender and outcome as assessed by modified rankin score (mRS) in hemorrhagic stroke at discharge, 30 days and 60 days follow up is not statistically significant.

SITE OF BLEED

In our study, 38 patients had gangliocapsular bleed, 28 had lobar bleed, 18 had thalmocapsular, 7 had cerebellar bleed, 4 had thalmocapsular with brainstem bleed, 2 had thalamic with brainstem bleed, 2 had only brainstem bleed and remaining 1 had only thalamic bleed.

Table 7: Site of bleed in patients with hemorrhagic stroke

Site of bleed (gangliocapsular-1, Thalamic - 2, cerebellum - 3, Pontine/brainstem - 4, cortical/atypical - 5)	No. of cases	Percentage
1	38	38.0%
1 and 2	18	18.0%
1,2 and 4	4	4.0%
2	1	1.0%
2 and 4	2	2.0%
3	7	7.0%
4	2	2.0%
5	28	28.0%
Total	100	100.0%

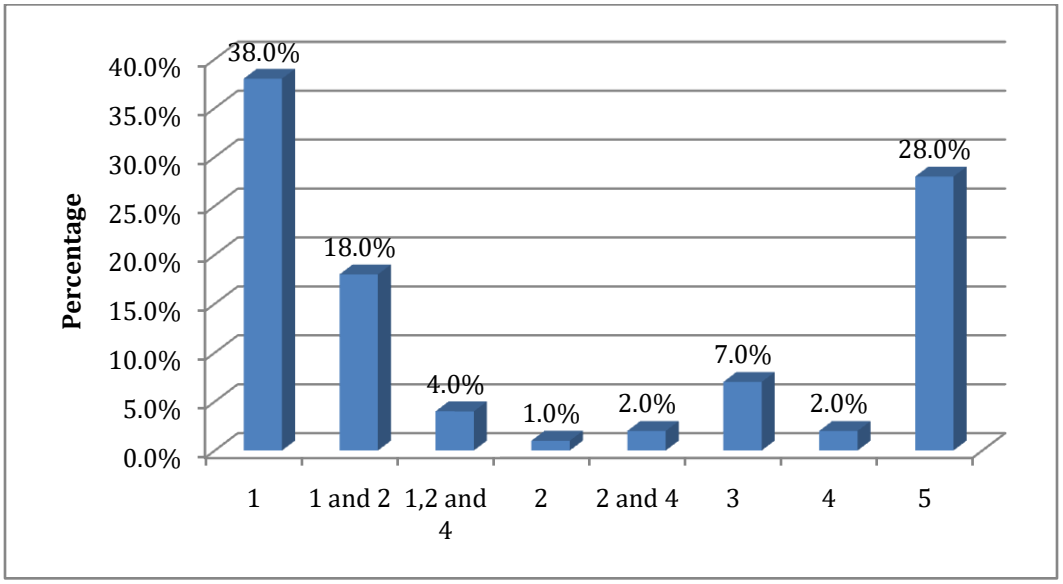


Figure 7: Site of bleed in patients with hemorrhagic stroke

The most common site of bleed in our study was gangliocapsular (38%) followed by lobar (28%). The least common site of bleed was thalamic (1%) followed by brainstem (2%).

Table 8: Influence of site of bleed on outcome of hemorrhagic stroke as assessed by mRS at the time of discharge from the hospital:

		mRS- group at discharge						Total	p-value
		≤ 3		4-5		6			
Site of bleed (gangliocapsular-1, Thalamic - 2, cerebellum - 3, Pontine/brainstem-4, cortical/atypical - 5)	1	3	7.9%	34	89.5%	1	2.6%	38	0.035
	1 and 2	1	5.6%	16	88.9%	1	5.6%	18	
	1,2 and 4	0	0.0%	4	100.0%	0	0.0%	4	
	2	0	0.0%	1	100.0%	0	0.0%	1	
	2 and 4	0	0.0%	2	100.0%	0	0.0%	2	
	3	5	71.4%	2	28.6%	0	0.0%	7	
	4	0	0.0%	2	100.0%	0	0.0%	2	
	5	5	17.9%	21	75.0%	2	7.1%	28	
Total		14		82		4		100	

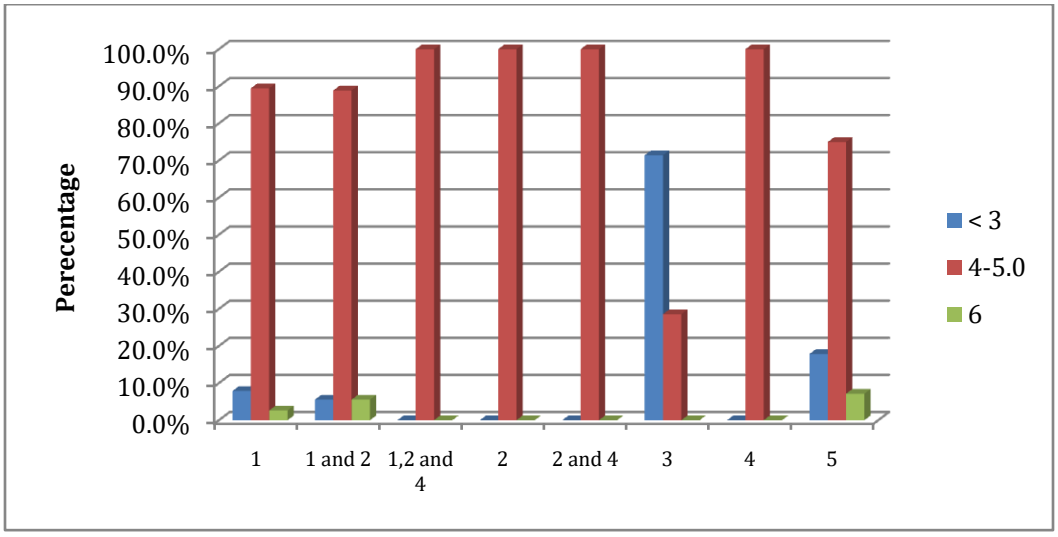


Figure 8: Influence of site of bleed on outcome of hemorrhagic stroke as assessed by mRS at the time of discharge from the hospital

Table 9: Influence of site of bleed on outcome of hemorrhagic stroke as assessed by mRS at 60 days follow up

		mRS- group 60 days						Total	p-value
		≤ 3		4-5		6			
Site of bleed (gangliocapsular-1, Thalamic - 2, cerebellum - 3, Pontine/brainstem-4, cortical/atypical - 5)	1	7	18.4%	26	68.4%	5	13.2%	38	0.108
	1 and 2	4	22.2%	10	55.6%	4	22.2%	18	
	1,2 and 4	0	0.0%	2	50.0%	2	50.0%	4	
	2	0	0.0%	1	100.0%	0	0.0%	1	
	2 and 4	0	0.0%	2	100.0%	0	0.0%	2	
	3	5	71.4%	2	28.6%	0	0.0%	7	
	4	0	0.0%	1	50.0%	1	50.0%	2	
	5	9	32.1%	11	39.3%	8	28.6%	28	
Total		25		55		20		100	

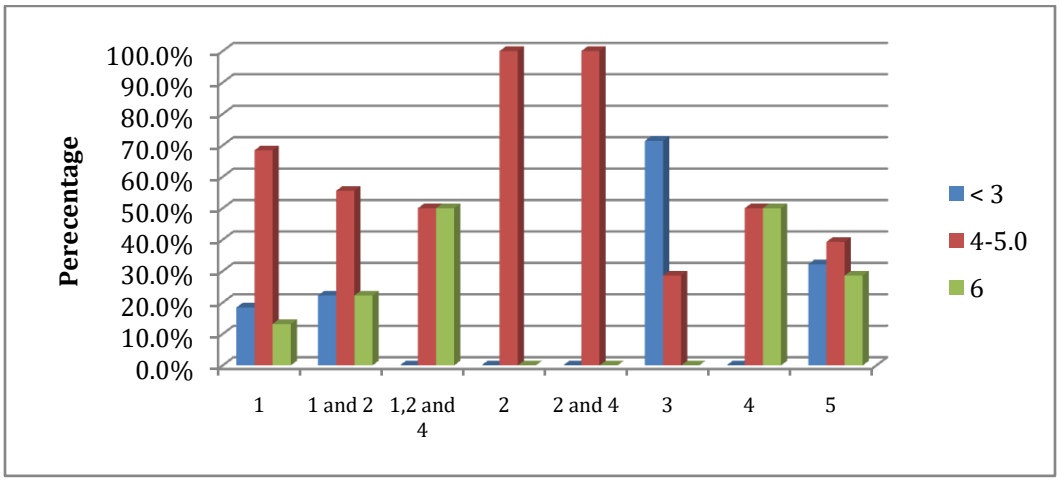


Figure 9: Influence of site of bleed on outcome of hemorrhagic stroke as assessed by mRS at 60 days follow up

In our study, Cerebellar bleed had the best prognosis, with majority of the patients having mRS score ≤3 at the time of discharge from the hospital and 60 days follow up and the Brainstem and Thalamic bleed had the worst prognosis with all the patients having mRS score >=4 at the time of discharge and 60 days follow up.

SIDE OF BLEED

Out of 100 patients in our study, 49 (49%) had right sided bleed and 50 (50%) had left sided bleed with 1 patient (1%) having b/l bleed.

Table 10: Side of bleed in patients with acute hemorrhagic stroke:

Side of bleed	No. of cases	Percentage
Right	49	49.0%
Left	50	50.0%
B/L	1	1.0%

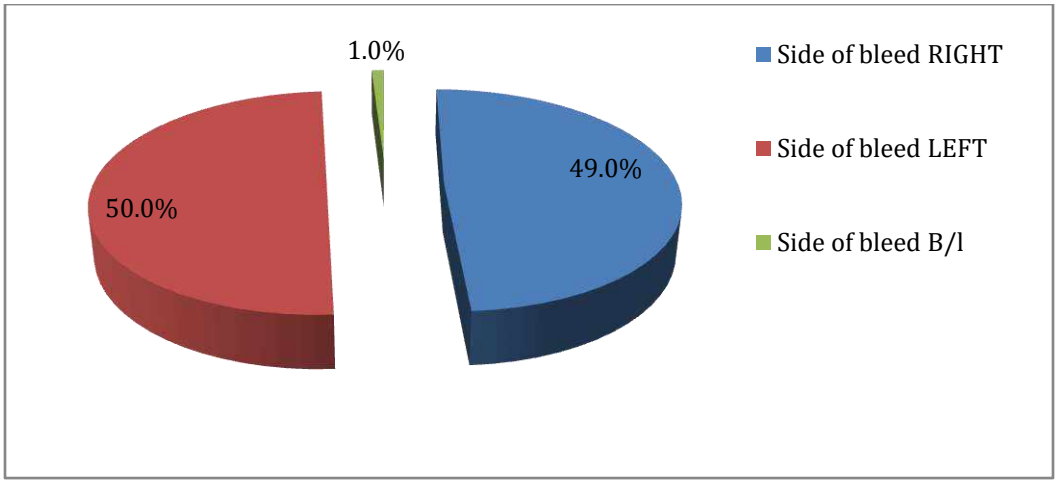


Figure 10: Side of bleed in patients with acute hemorrhagic stroke:

Table 11: Distribution of side of bleed with gender

		Gender				Total	Chi-square value	p-value
		Female		Male				
Side of bleed RIGHT	NO	15	47%	36	53%	51	0.32	0.571
	Yes	17	53%	32	47%	49		
Total		32	100%	68	100%	100		

		Gender				Total	Chi-square value	p-value
		Female		Male				
Side of bleed LEFT	NO	18	56%	32	47%	50	0.735	0.391
	Yes	14	44%	36	53%	50		
Total		32	100%	68	100%	100		

		Gender				Total	Chi-square value	p-value
		Female		Male				
Side of bleed B/L	B/L	1	3%	0	0%	1	2.146	0.320
	NO	31	97%	68	100%	99		
Total		32	100%	68	100%	100		

Among 32 females, 17 (53%) had right sided bleed, 14 (44%) had left sided and one (3%) had B/L bleed. Among 68 males, 32 (47%) had right sided bleed and 36 (53%) had left sided.

It was found that females had right sided bleed (53%) more common as compared to left sided bleed (44%). 1 female patient had bilateral bleed.

CLINICAL PRESENTATION

Table 12: Clinical presentation of patients with acute hemorrhagic stroke

Clinical Presentation	No of cases	Percentage
Weakness	86	86%
Vomiting	44	44%
Headache	32	32%
Seizure	7	7%

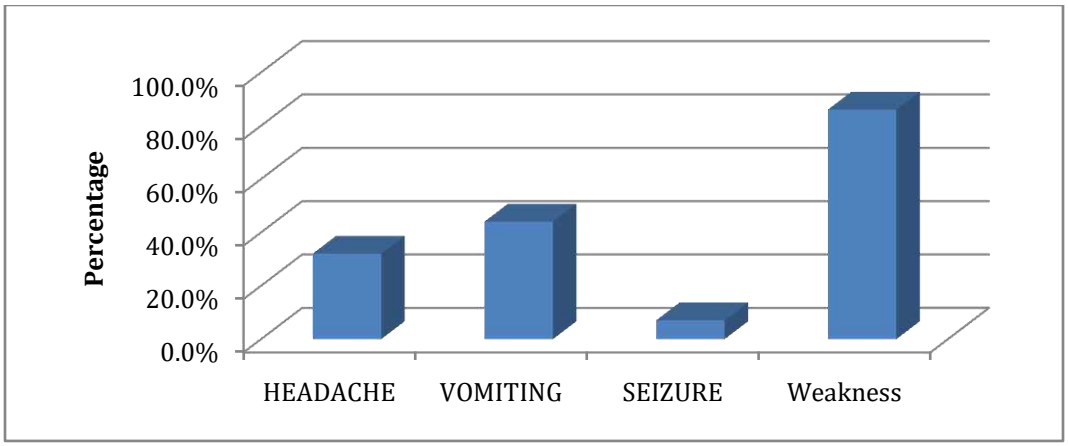


Figure 12: Clinical presentation of patients with acute hemorrhagic stroke

In our study, 86% patients presented with weakness in one or more limbs, 44 percent presented with vomiting, 32 percent with headache and 7 percent patients presented with seizures.

Among 86 patients admitted with weakness, 45 had right sided weakness and 41 had left sided. Among 45, 1 patient admitted with monoparesis, 2 with monoplegia, 15 with hemiparesis and 27 with hemiplegia. Among 41 having left sided weakness, 1 had monoparesis, 10 had hemiparesis and 30 had hemiplegia.

Table 13: Weakness in patients with acute hemorrhagic stroke

	Right		Left	
	No. of cases	Right	No. of cases	Left
MONOPARESÌS	1	1.0%	1	1.0%
MONOPLEGIA	2	2.0%	0	0.0%
HEMIPARESIS	15	15.0%	10	10.0%
HEMIPLEGIA	27	27.0%	30	30.0%

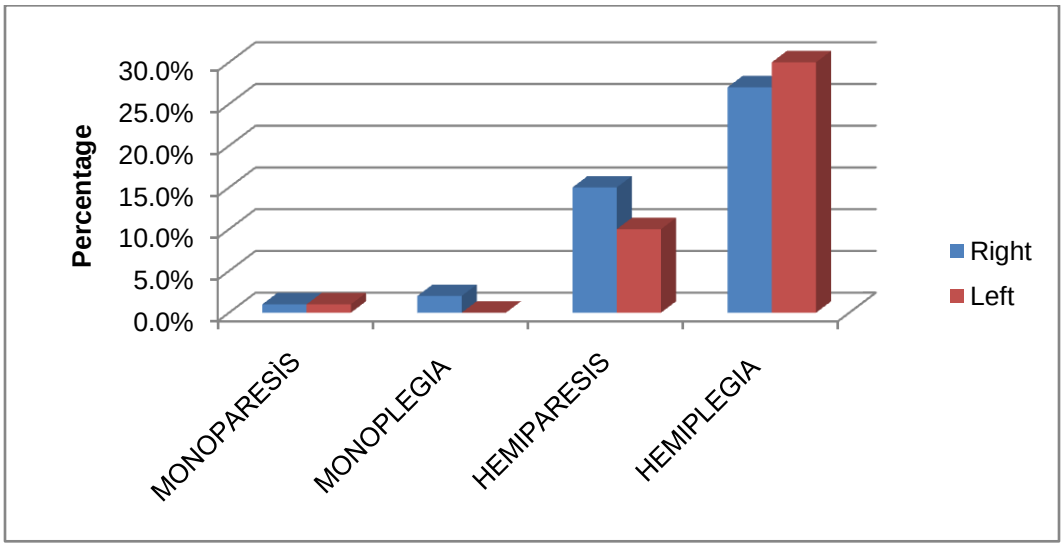


Figure 13: Weakness in patients with acute hemorrhagic stroke

Table 14: Sensorium in patients with acute hemorrhagic stroke

Sensorium	No. of cases	Percentage
conscious well oriented	25	25.0%
drowsy but arousable	54	54.0%
Unconscious	21	21.0%
Total	100	100.0%

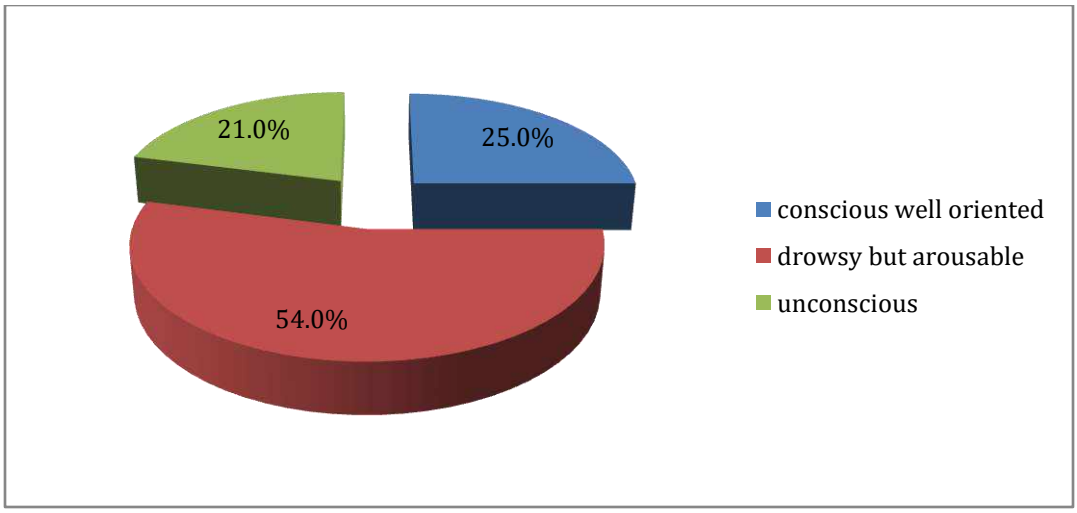


Figure 14: Sensorium in patients with acute hemorrhagic stroke:

In our study out of 100 patients, 25 were conscious well oriented with GCS e4v5m6, and 54 were drowsy but arousable and 21 patients were unconscious on presentation with GCS e1v1m1.

Table 15: Relationship of clinical presentation with site of bleed

		Site of bleed (gangliocapsular-1, Thalamic -2, cerebellum - 3, Pontine/brainstem - 4, cortical/atypical - 5)								Total	Chi-square value	p-value
		1	1 and 2	1,2 and 4	2	2 and 4	3	4	5			
HEADACHE	NO	33	12	4	0	2	2	2	13	68	23.093	0.002
	YES	5	6	0	1	0	5	0	15	32		
VOMITING	NO	26	11	4	0	2	0	1	12	56	19.458	0.007
	YES	12	7	0	1	0	7	1	16	44		
SEIZURE	NO	38	17	4	1	2	7	2	22	93	13.076	0.070
	YES	0	1	0	0	0	0	0	6	7		
Total		38	18	4	1	2	7	2	28	100		

In our study out of 100 patients, headache was present in 32 patients, 44 patients had vomiting on presentation and seizure was present in 7 patients.

Among 32 patients with headache, 5 (15%) had gangliocapsular bleed with 6 (19%) had gangliothalamic, 1 (3%) had thalamic, 5 (16%) had cerebellar and 15 (47%) had lobar bleed. So headache as presenting complaint was most commonly seen in lobar bleed.

Among 44 patients presenting with vomiting, 12 had gangliocapsular bleed, 7 had gangliothalamic, 1 had thalamic, 7 had cerebellar, 1 had brainstem and 16 had lobar bleed. So vomiting was most commonly seen in lobar bleed.

Among 7 patients with seizure, 1 had gangliothalamic and 6 had lobar bleed.

Table 16: Speech disturbance in patients with acute hemorrhagic stroke

SPEECH DISTURBANCE	No. of cases	Percentage
Broca's aphasia	6	6.0%
Global aphasia	1	1.0%
NO	67	70.0%
YES	26	23.0%
Total	100	100.0%

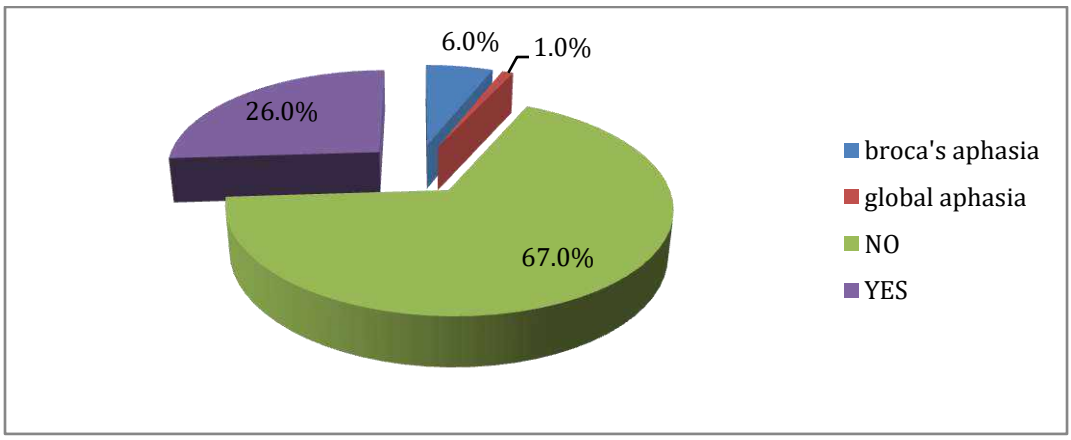


Figure 15: Speech disturbance in patients with acute hemorrhagic stroke

In our study, out of 100, 6 patients were having Broca's aphasia, 1 was having Global aphasia and 26 patients were having slurring of speech. Among 26 patients, 13 each were having left sided and right sided facial nerve palsy (UMN type).

Table 17: Facial nerve palsy UMN type in patients with acute hemorrhagic stroke

2. Cranial nerves	No. of cases	Percentage
Left UMN facial nerve palsy	13	13.0%
Normal	74	73.0%
Right UMN facial nerve palsy	13	14.0%
Total	100	100.0%

RISK FACTORS

1. Glasgow Coma Scale (GCS)

The Glasgow coma score was used to ascertain the level of consciousness at the time of presentation to the hospital and was graded as per severity. A highly significant positive correlation was obtained between the GCS on admission and outcome at discharge, 30 days and 60 days follow up.

Table 18: GCS in Patients with acute hemorrhagic stroke

GCS group	No. of cases	Percentage
3-4	18	18.0%
5-12	54	54.0%
≥ 13	28	28.0%
Total	100	100.0%

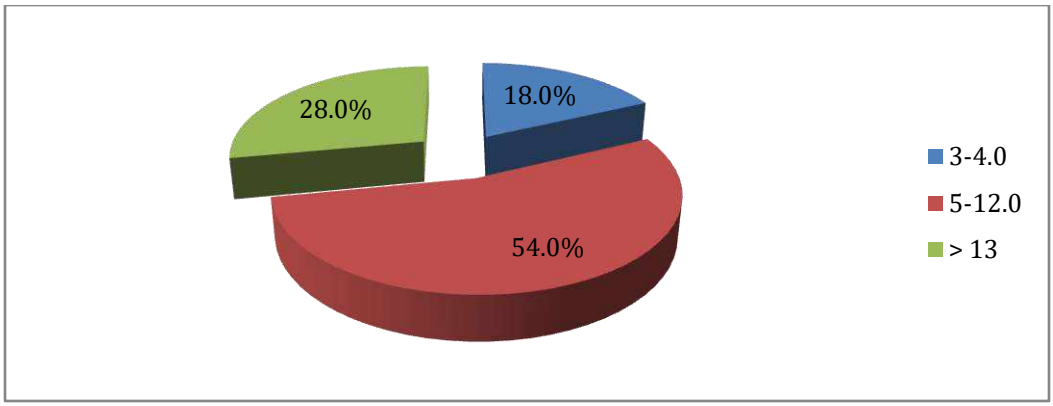


FIGURE 16: GCS in Patients with acute hemorrhagic stroke

In our study out of 100 patients, at the time of presentation to the hospital, 18 patients had GCS between 3-4, 54 had between 5-12 and 28 patients had GCS ≥ 13.

Table 19: Influence of GCS (calculated at the time of presentation to hospital) on outcome of hemorrhagic stroke (as assessed by mRS)

(i) At the time of discharge from hospital:

		mRS- group						Total	Chi-square value	p-value
		≤ 3		4-5		6				
GCS group	3-4	0	0.0%	17	20.7%	1	25.0%	18	34.639	0.0001
	5-12	1	7.1%	50	61.0%	3	75.0%	54		
	≥ 13	13	92.9%	15	18.3%	0	0.0%	28		
Total		14	100.0%	82	100.0%	4	100.0%	100		

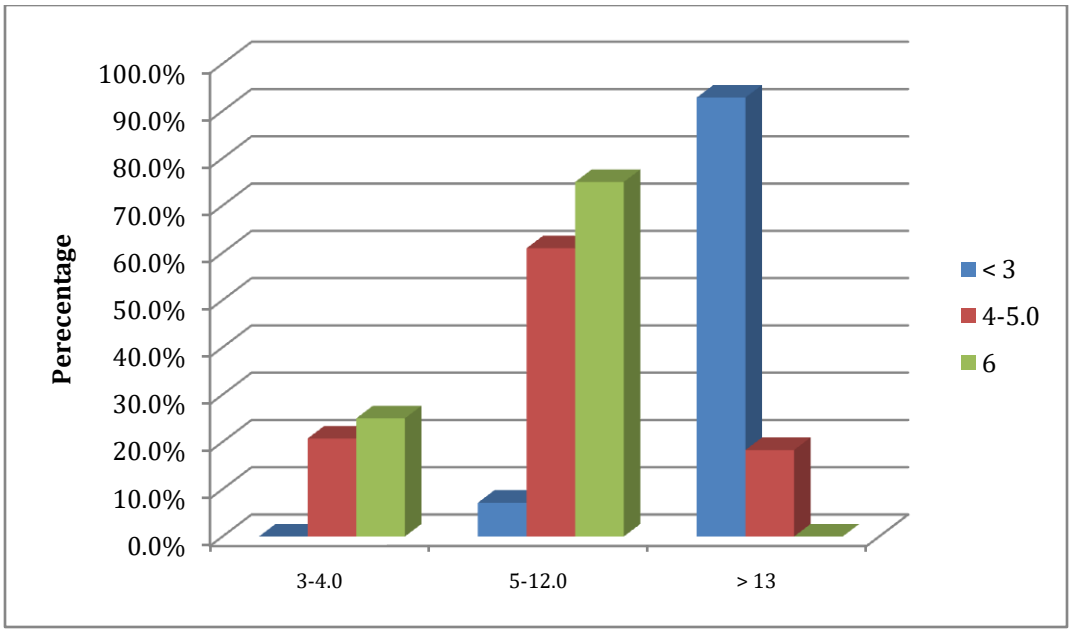


Figure 17: Influence of GCS (calculated at the time of presentation to hospital) on outcome of hemorrhagic stroke (as assessed by mRS) at discharge from the hospital:

In our study out of 100 patients, 18 patients had GCS between 3-4 at the time of presentation to hospital. All the 18 had poor prognosis at the time of discharge from the hospital, having high mortality and morbidity, with 17 having mRS score between 4-5 (bed bound) and 1 patient dying during the course of hospital stay (mRS score 6).

Out of 54 patients having GCS between 5-12 at the time of presentation to the hospital, 1 had mRS score ≤3 at the time of discharge from the hospital with 50 patients having mRS score between 4-5 (bed bound) and 3 dying during the course of hospital stay (mRS score 6).

Out of 28 patients having GCS ≥ 13, at the time of presentation to the hospital, 13 had mRS score ≤3 with 15 patients having mRS score between 4-5 at the time of discharge from the hospital and no one dying during the course of hospital stay.

P value 0.0001 indicates Influence of GCS (calculated at the time of presentation to hospital) on outcome of hemorrhagic stroke (as assessed

by mRS) at the time of discharge from the hospital is highly statistically significant indicating poor GCS score calculated at the time of presentation to the hospital is a poor prognostic marker (consistent with poor future outcome) at the time of discharge in patients with acute hemorrhagic stroke, having high morbidity and mortality.

Table 20: Influence of GCS (calculated at the time of presentation to hospital) on outcome of hemorrhagic stroke (as assessed by mRS) at 60 days follow up:

(ii) At 60 days follow up

		mRS- group 60 days						Total	Chi-square value	p-value
		≤ 3		4-5		6				
GCS group	3-4	0	0.0%	3	5.5%	15	75.0%	18	117.592	0.0001
	5-12	2	8.0%	47	85.5%	5	25.0%	54		
	≥ 13	23	92.0%	5	9.1%	0	0.0%	28		
Total		25	100.0%	55	100.0%	20	100.0%	100		

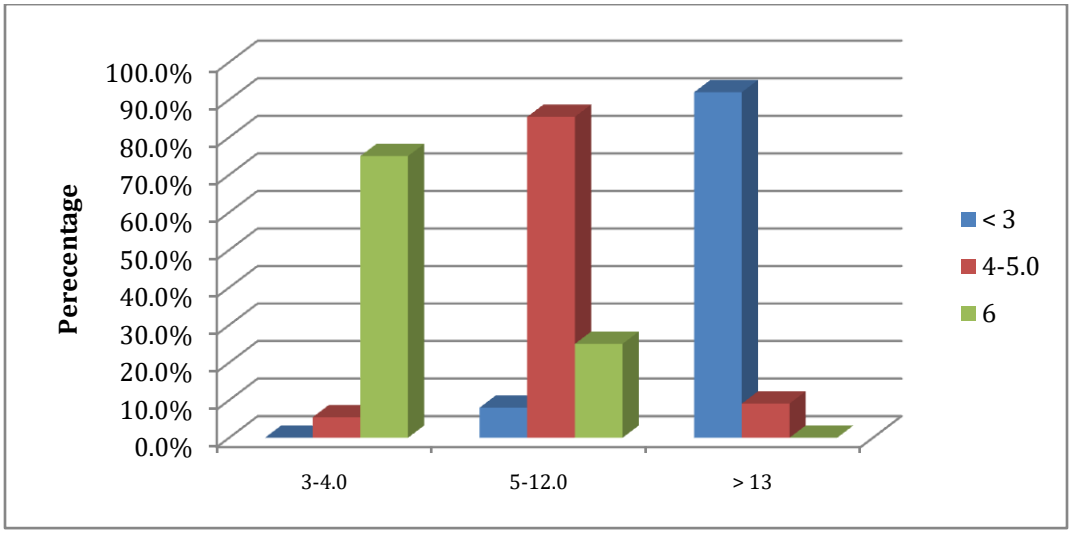


Figure 18: Influence of GCS (calculated at the time of presentation to hospital) on outcome of hemorrhagic stroke (as assessed by mRS) at 60 days follow up

At 60 days follow up, out of 18 patients with GCS between 3-4, all had poor prognosis, having high mortality and morbidity, with 3 patients (5.5%) having mRS score between 4-5 (bed bound) and 15 patients (75%) dying at the end of 60 days (mRS score 6).

Out of 54 patients with GCS between 5-12 at the time of presentation to the hospital, 2 patients (8%) had mRS score≤3, with 47 (85.5%) having mRS score between 4-5 (bed bound) and 5 patients (25%) dying at the end of 60 days (mRS score 6).

Out of 28 patients with GCS ≥13 at the time of presentation to the hospital, 23 patients (92%) had mRS score ≤3 (good prognosis) with 5 (9.1%) having score between 4-5 and no one dying at the end of 60 days

P value 0.0001 indicates Influence of GCS (calculated at the time of presentation to hospital) on outcome of hemorrhagic stroke (as assessed by mRS) at 60 days follow up is highly statistically significant indicating poor GCS score calculated at the time of presentation to the hospital is a poor prognostic marker (consistent with poor future outcome in patients with acute hemorrhagic stroke at 60 days follow up, having high morbidity and mortality).

2. Volume of hematoma:

The volume of the hematoma was calculated by the ABC/2 method from the baseline CT scan of the brain.

57 out of 100 patients which accounted for 57% of the group had volume of bleed $<$ 30 CC (and were given score 0) and 43% had volume of bleed ≥30 cc (were given score 1).

Table 21: Volume of hematoma in patients with acute hemorrhagic stroke

Volume of hematoma on baseline CT scan of brain by ABC/2 formula	No. of cases	Percentage
0 (< 30cc)	57	57.0%
1 (≥30cc)	43	43.0%
Total	100	100.0%

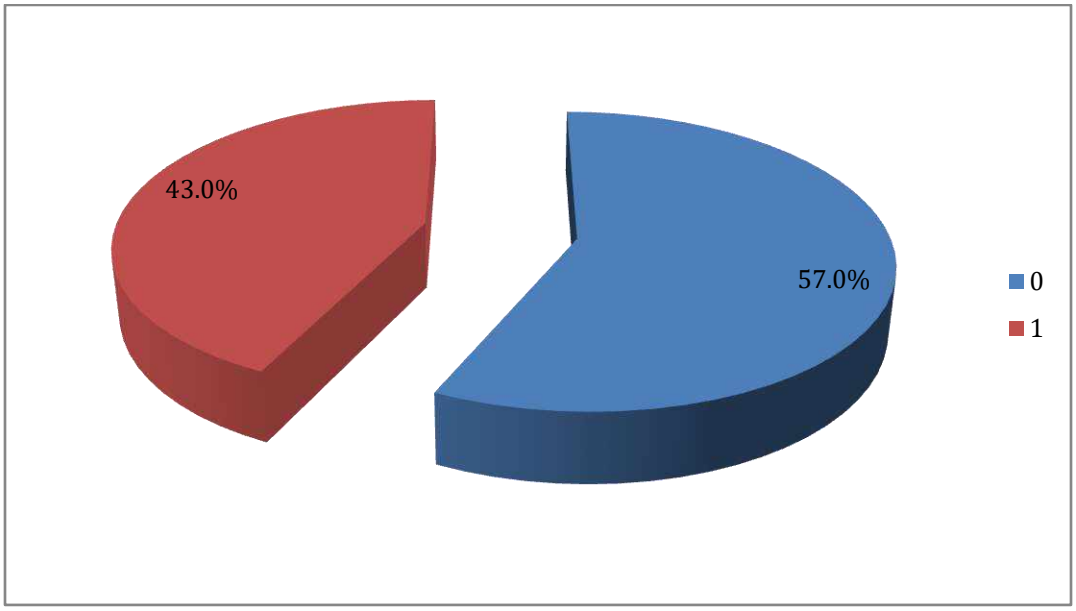


Figure 19: Volume of hematoma in patients with acute hemorrhagic stroke

Table 22: Influence of volume of hematoma (on baseline CT scan of the brain) on outcome of hemorrhagic stroke (assessed using mRS)

(i) At the time of discharge from the hospital

		mRS- group						Total	Chi-square value	p-value
		≤ 3		4-5		6				
Volume of hematoma on baseline CT scan of brain by ABC/2 formula	0 (< 30cc)	14	100.0%	41	50.0%	2	50.0%	57	28.619	0.001
	1 (≥30cc)	0	0.0%	41	50.0%	2	50.0%	43		

Out of 43 patients with volume of hematoma more than ≥30cc on baseline ct scan of the brain, all had poor prognosis at the time of discharge from the hospital, having high mortality and morbidity, with 41 patients having mRS score between 4-5 (bed bound) and 2 patients dying during the course of hospital stay (mRS score 6).

P value 0.001 indicates that the influence of volume of hematoma on outcome of hemorrhagic stroke (assessed using mRS) at the time of discharge is highly statistically significant indicating higher volume of hematoma (≥30cc) in baseline CT scan is consistent with poor future outcome at discharge in acute hemorrhagic stroke patients, with high mortality and morbidity.

Table 23: Influence of volume of hematoma (on baseline CT scan of the brain) on outcome of hemorrhagic stroke (assessed using mRS)

(ii) At 60 days follow up:

		mRS- group 60 days						Total	Chi-square value	p-value
		≤ 3		4-5		6				
Volume of hematoma on baseline CT scan of brain by ABC/2 formula	0 (<30cc)	25	100.0%	27	49.1%	5	25.0%	57	28.619	0.001
	1 (≥30cc)	0	0.0%	28	50.9%	15	75.0%	43		

At 60 days follow up, out of 43 patients with volume of hematoma ≥30cc, all had poor prognosis with 28 patients having mRS score between 4-5 (bed bound) and 15 patients dying at the end of 60 days (mRS score 6).

P value 0.001 indicates that the influence of volume of hematoma on outcome of hemorrhagic stroke (as assessed using mRS) at 60 days follow up is highly statistically significant indicating higher volume of hematoma (≥30cc) in baseline CT scan is consistent with poor future outcome in acute hemorrhagic stroke patients at 60 days follow up, with high mortality and morbidity.

3. Location of Hematoma (Infratentorial origin)

Out of 100 patients included in the study, 25 patients have infratentorial location of hematoma and 75 have supratentorial location.

Table 24: Location of hematoma in patients with acute hemorrhagic stroke

Location of hematoma (infratentorial or supratentorial) Infratentorial origin	No. of cases	Percentage
no (score 0)	75	75.0%
yes (score 1)	25	25.0%
Total	100	100.0%

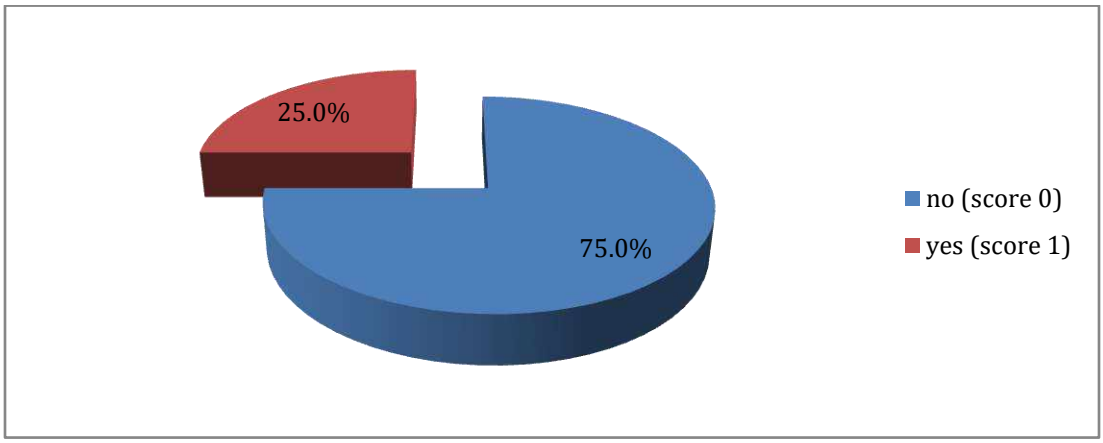


Figure 20: Location of hematoma in patients with acute hemorrhagic stroke

Of the 4 patients who died at discharge only 1 had Infratentorial location of hematoma. At discharge, 28 percent of patients with infratentorial hematoma had mRS score≤3 as compared to 9 percent of patients with supratentorial location.

Table 25: Influence of infratentorial origin of hematoma on outcome of hemorrhagic stroke (as assessed using mRS)

(i) At the time of discharge from the hospital

		mRS- group 60 days						Total	Chi-square value	p-value
	Infratentorial origin	≤3		4-5		6				
Location of hematoma (infratentorial or supratentorial) Infratentorial origin	No (score 0)	7	50.0%	65	79.3%	3	75.0%	75	5.463	0.065
	Yes (score 1)	7	50.0%	17	20.7%	1	25.0%	25		

Out of 25 patients with infratentorial origin of hematoma, at discharge 7 (50%) had mRS score≤3, 17 patients (20.7%) had score between 4-5 and one (25%) died during the course of hospital stay (mRS 6).

P value is 0.065 indicates that the influence of infratentorial origin of hematoma on outcome of hemorrhagic stroke (as assessed using mRS) at the time of discharge from the hospital is not statistically significant.

Table 26: Influence of infratentorial origin of hematoma on outcome of hemorrhagic stroke (as assessed using mRS)

(ii) At 60 days follow up

		mRS- group 60 days						Total	Chi-square value	p-value
	Infratentorial origin	≤ 3		4-5		6				
Location of hematoma (infratentorial or supratentorial) Infratentorial origin	No (score 0)	17	68.0%	44	80.0%	14	70.0%	75	1.653	0.438
	Yes (score 1)	8	32.0%	11	20.0%	6	30.0%	25		

Among 25 having infratentorial location of hematoma at 60 days follow up, 8 had mRS score≤3, 11 patients had score between 4-5 and 6 patients died at the end of 60 days (mRS score 6).

P value is 0.438, indicates that Influence of infratentorial origin of hematoma on outcome of hemorrhagic stroke (as assessed using mRS) is not statistically significant.

4. Presence of Intraventricular Hemorrhage (IVH):

Out of 100 patients in our study, 71 patients had presence of IVH.

Table 27: Presence of IVH in patients with acute hemorrhagic stroke

Presence of intraventricular extension	No. of cases	Percentage
no (score 0)	29	29.0%
yes (score 1)	71	71.0%
Total	100	100.0%

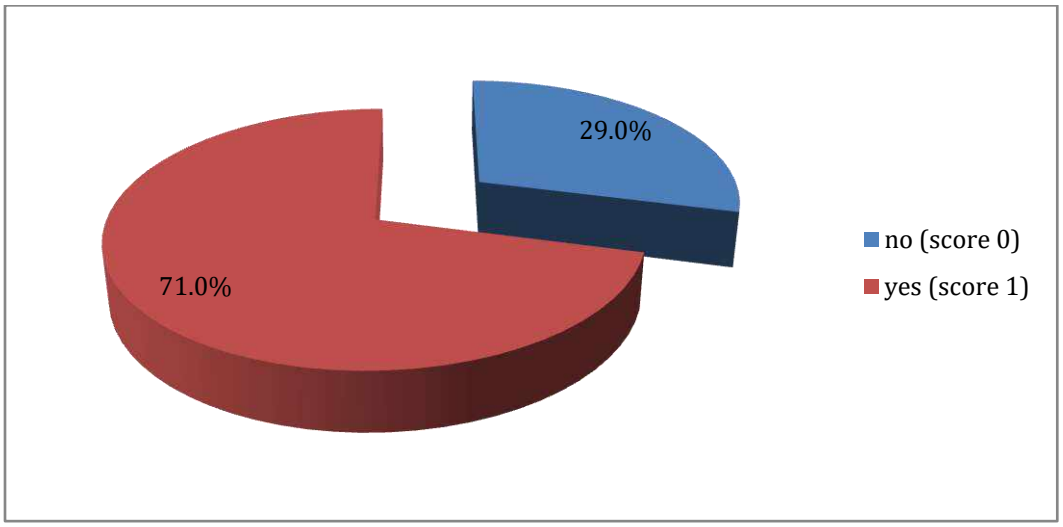


Figure 21: Presence of IVH in patients with acute hemorrhagic stroke

Table 28: Influence of presence of IVH on outcome of hemorrhagic stroke (as assessed using mRS)

(i) At the time of discharge from the hospital

		mRS- group						Total	Chi-square value	p-value
		≤3		4-5		6				
Presence of intraventricular extension	no (score 0)	11	78.6%	18	22.0%	0	00.0%	29	22.231	0.0001
	yes (score 1)	3	21.4%	64	78.0%	4	100.0%	71		
Total		14	100.0%	82	100.0%	4	100.0%	100		

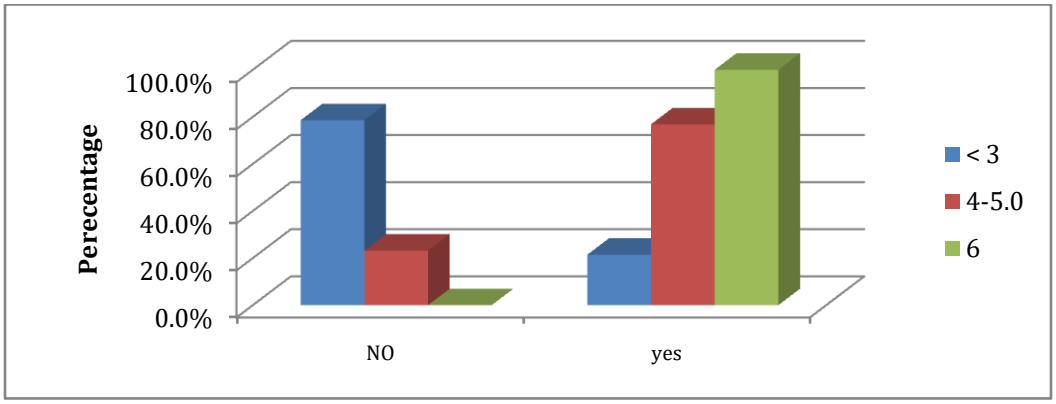


Figure 22: Influence of presence of IVH on outcome of hemorrhagic stroke (as assessed using mRS) at discharge from the hospital

Out of 71 patients with IVH in our study, at discharge 3(21.4%) had mRS score≤3 compared to 11(78.6%) having mRS score≤3 without IVH, 64(78%) patients with IVH had mRS score between 4-5 (bed bound) compared to 18 (22%) patients without IVH and 4 died during the course of hospital stay (mRS score 6) with IVH compared to no death at discharge of patients without IVH.

P value 0.0001 indicates that influence of presence of IVH on outcome of hemorrhagic stroke (as assessed using mRS) at discharge is highly statistically significant indicating presence of IVH is a poor prognostic marker, with high mortality and morbidity.

Table 29: Influence of presence of IVH on outcome of hemorrhagic stroke (as assessed using mRS) at 60 days follow up:

(ii) At 60 days follow up

		mRS- group 60 days						Total	Chi-square value	p-value
		≤3		4-5		6				
Presence of intraventricular extension	no (score 0)	19	76.0%	9	16.4%	1	5.0%	29	36.682	0.0001
	yes (score 1)	6	24.0%	46	83.6%	19	95.0%	71		
Total		25	100.0%	55	100.0%	20	100.0%	100		

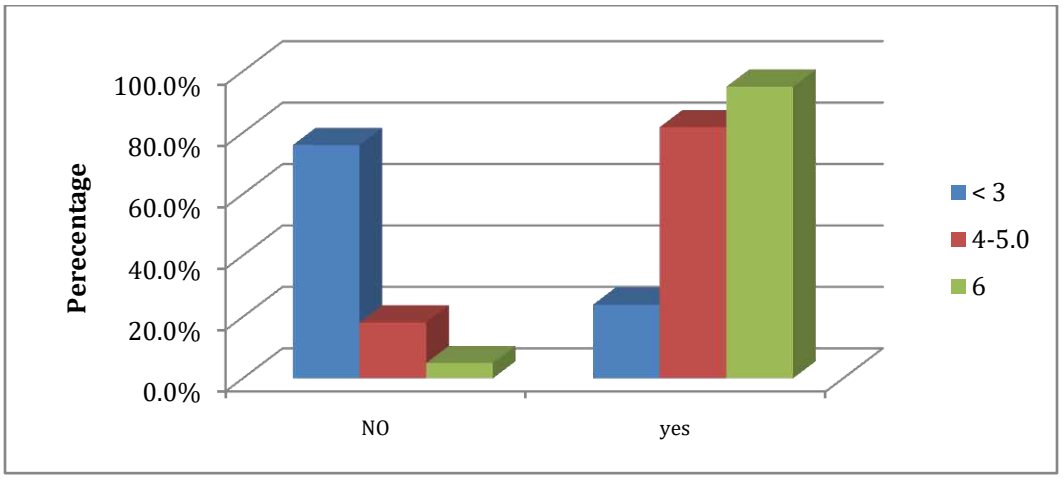


Figure 23: Influence of presence of IVH on outcome of hemorrhagic stroke (as assessed using mRS) at 60 days follow up

At 60 days follow up, out of 71 patients with IVH, 6 (24%) had mRS score≤3 compared to 19 (76%) without IVH, 46 patients (83.6) with IVH had mRS score between 4-5 (bed bound) compared to 9 (16.4%) without IVH and 19 patients with IVH died at the end of 60 days (mRS score 6) compared to one death without IVH.

P value 0.0001 indicates influence of presence of ivh on outcome of hemorrhagic stroke (as assessed using mRS) at 60 days follow up is highly significant indicating presence of IVH is consistent with poor future outcome in acute hemorrhagic stroke patients.

5. ICH Score

ICH score calculated at the time of presentation to hospital comprising of 5 parameters age, GCS, volume of hematoma, location of hematoma and presence of IVH.

Table 30: ICH score in patients with acute hemorrhagic stroke

ICH score Total Score	No. of cases	Percentage
0	15	15.0%
1	17	17.0%
2	13	13.0%
3	35	35.0%
4	11	11.0%
5	9	9.0%
Total	100	100.0%

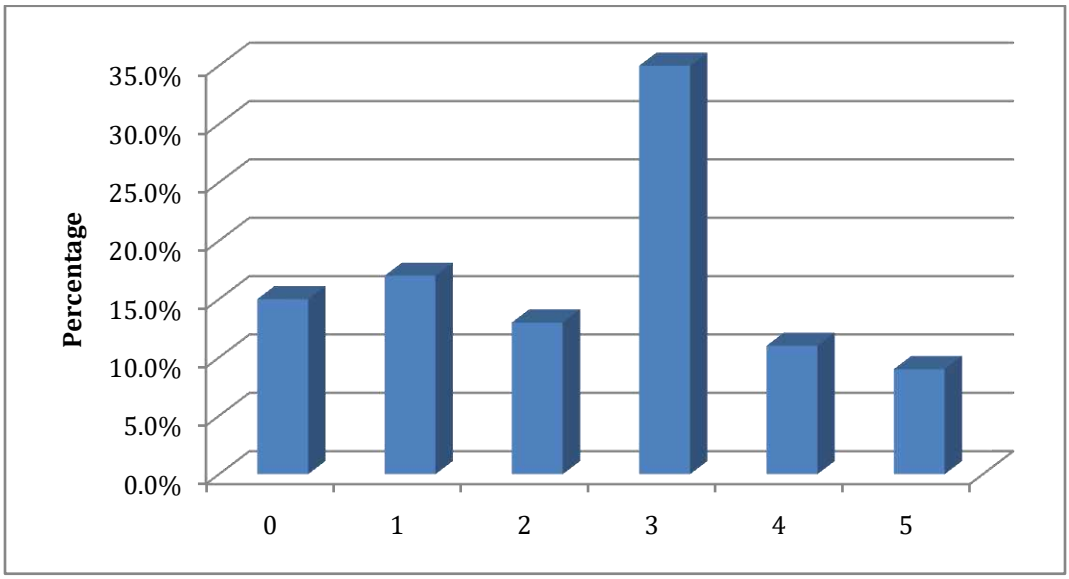


Figure 24: ICH score in patients with acute hemorrhagic stroke

In our study, 32 patients had ICH score between 0-1 (with 15 having zero ICH score and 17 having score1). 13 patients had ICH score as 2. 55 patients had ICH score as ≥3 (with 35 patients having ICH score as 3, 11 with Ich score 4 and 9 patients had ICH score as 5).

Table 31: Influence of ICH score on outcome of hemorrhagic stroke as assessed using mRS at discharge, 30 days and 60 days follow up

		ICH SCORE						Total	Chi-square value	p-value
		0-1		2		≥3				
mRS-group at discharge	≤3	12	37.5%	2	15.4%	0	0.0%	14	25.88	0.0001
	4-5	20	62.5%	11	84.6%	51	92.7%	82		
	6	0	0.0%	0	0.0%	4	7.3%	4		
mRS-group at 30 days follow up	≤3	15	46.9%	2	15.4%	0	0.0%	17	41.02	0.0001
	4-5	16	50.0%	11	84.6%	36	65.5%	63		
	6	1	3.1%	0	0.0%	19	34.5%	20		
mRS-group at 60 days follow up	≤3	22	68.8%	3	23.1%	0	0.0%	25	57.675	0.0001
	4-5	9	28.1%	10	76.9%	36	65.5%	55		
	6	1	3.1%	0	0.0%	19	34.5%	20		
Total		32	100.0%	13	100.0%	55	100.0%	100		

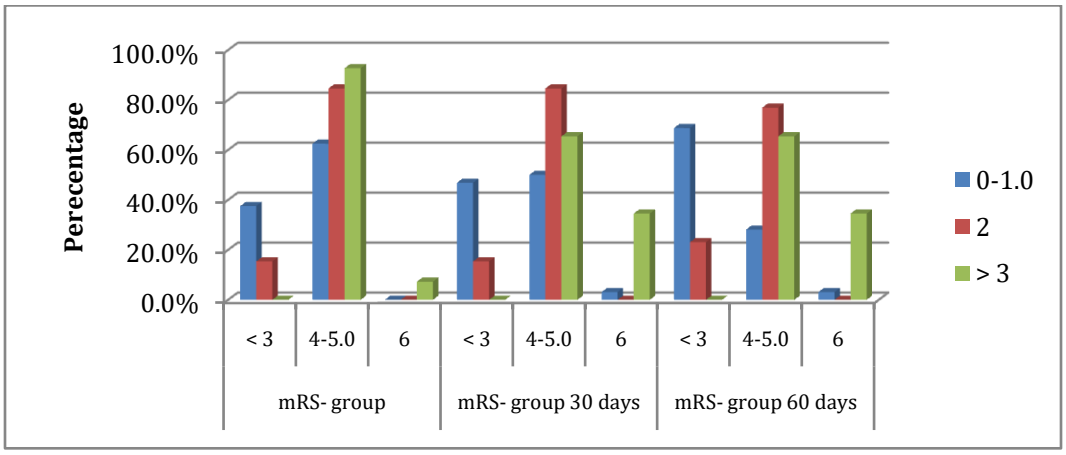


Figure 25: Influence of ICH score on outcome of hemorrhagic stroke as assessed using mRS at discharge, 30 days and 60 days follow up

Out of 55 patients with ICH score ≥3, at discharge, no patient had mRS score≤3, 51 (92.7%) had mRS score between 4-5 (bed bound) and 4 patients (7.3%) expired during the course of hospital stay (mRS score 6) compared to 12 (37.5%) patients having mRS score ≤3 with ICH score between 0-1, 20 (62.5%) patients having mRS score between 4-5 and no patient with mRS score 6 (no patient died at discharge with ICH score 0-1).

At 30 days follow up, out of 55 patients with ICH score ≥3, 36 (65.5%) had mRS score between 4-5 (bed bound) and 19 patients (34.5%) died at the end of 30 days (mRS score 6) compared to 16 (50%) patients with ICH score 0-1 having mRS score between 4-5 and one (3.1%) patient died at the end of 30 days with ICH score 0-1 and remaining 15 (46.9%) having mRS score ≤3.

At 60 days follow up, among 55 patients with ICH score ≥3, 36 (65.5%) had mRS score between 4-5 (bed bound) and 19 patients (34.5%) died at the end of 60 days compared to 9 (28.1%) patients with ICH score between 0-1 having mRS score between 4-5 and one (3.1%) patient with ICH score 0-1 died at the end of 60 days with remaining 22 (68.8%) having mRS score ≤3 at the end of 60 days.

P value 0.0001 indicates highly significant correlation of high Ich score (≥3) with poor future outcome in acute hemorrhagic stroke patients as assessed using mRS at discharge, 30 days and 60 days follow up. So ICH score calculated at the time of presentation to the hospital can be used as a future outcome predictor. More is the ICH score, more poor is the future outcome (high morbidity (mRS = 4-5- bed bound) and mortality (mRS =6). In my study maximum patients with poor future outcome mRS score ≥4 at discharge, 30 days and 60 days follow up had ICH score ≥3.

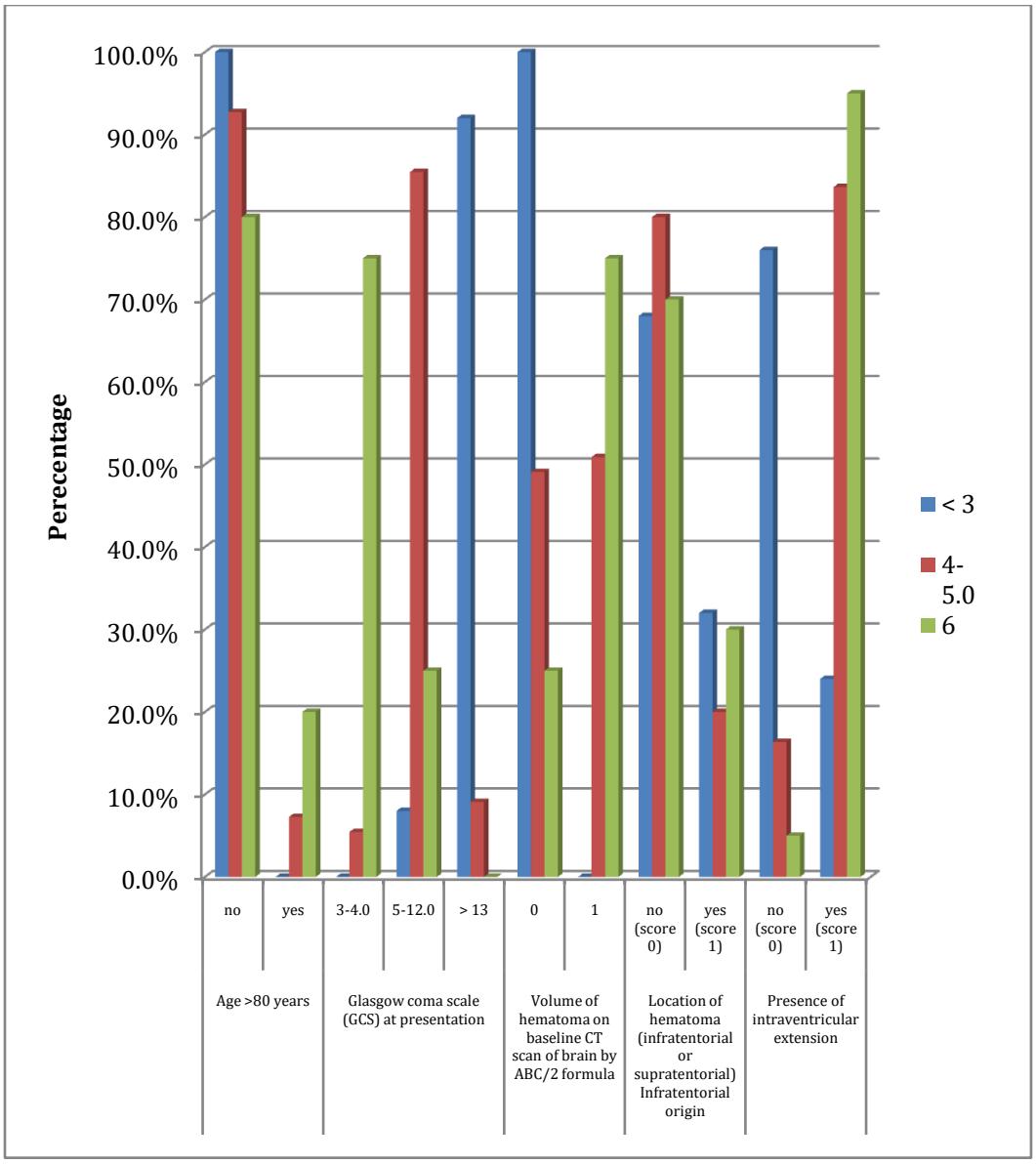


Figure 26: Influence of ICH score parameters (age >80 years, GCS, volume of hematoma ≥30cc, infratentorial location of hematoma and presence of IVH on outcome of hemorrhagic stroke as assessed by mRS at 60 days follow up

In our study, most of the patients with poor GCS (3-4), volume of hematoma ≥30cc and presence of IVH had poor future outcome, having mRS score ≥4 with high mortality and morbidity.

6. Presence of Hydrocephalus

In our study out of 100 patients, 7 had hydrocephalus and had undergone EVD insertion.

Table 32: Influence of presence of hydrocephalus on outcome of hemorrhagic stroke as assessed by mRS

(i) At discharge from the hospital

		mRS- group						Total	Chi-square value	p-value
		≤ 3		4-5		6				
Hydrocephalus	NO	14	100.0%	76	92.7%	3	75.0%	93	3.057	0.217
	Present	0	0.0%	6	7.3%	1	25.0%	7		
Total		14	100.0%	82	100.0%	4	100.0%	100		

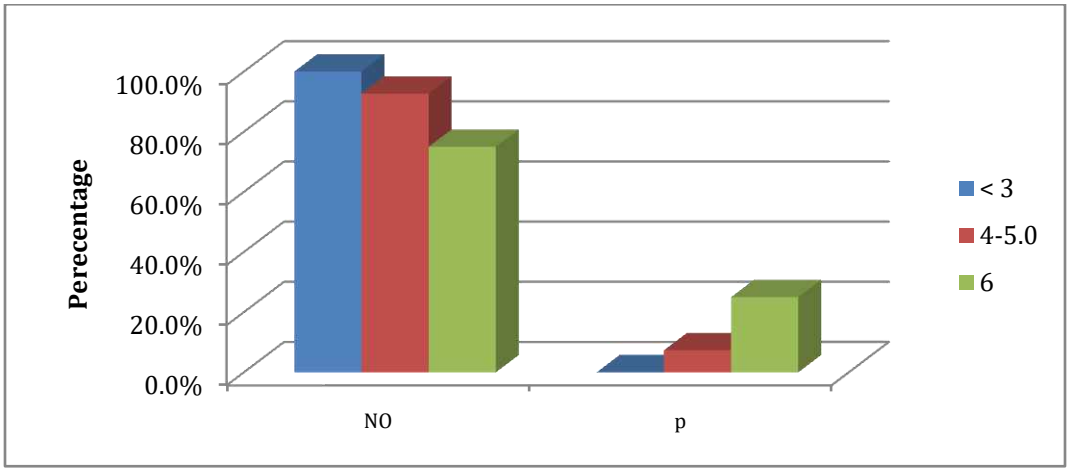


Figure 27: Influence of presence of hydrocephalus on outcome of hemorrhagic stroke as assessed by mRS at discharge

Out of 7 patients having hydrocephalus, all had mRS score ≥4 (poor outcome) at discharge with 6 patients having mRS score between 4-5 (bed bound) and one dying during the course of hospital stay (mRS score 6) but p value 0.217 indicates that the Influence of presence of hydrocephalus on outcome of hemorrhagic stroke (as assessed by mRS) at discharge is not statistically significant.

Table 33: Influence of presence of hydrocephalus on outcome of hemorrhagic stroke as assessed by mRS at 60 days follow up

(ii) At 60 days follow up

		mRS- group 60 days						Total	Chi-square value	p-value
		≤ 3		4-5		6				
Hydrocephalus	NO	25	100.0%	51	92.7%	17	85.0%	93	3.854	0.146
	Present	0	0.0%	4	7.3%	3	15.0%	7		
Total		25	100.0%	55	100.0%	20	100.0%	100		

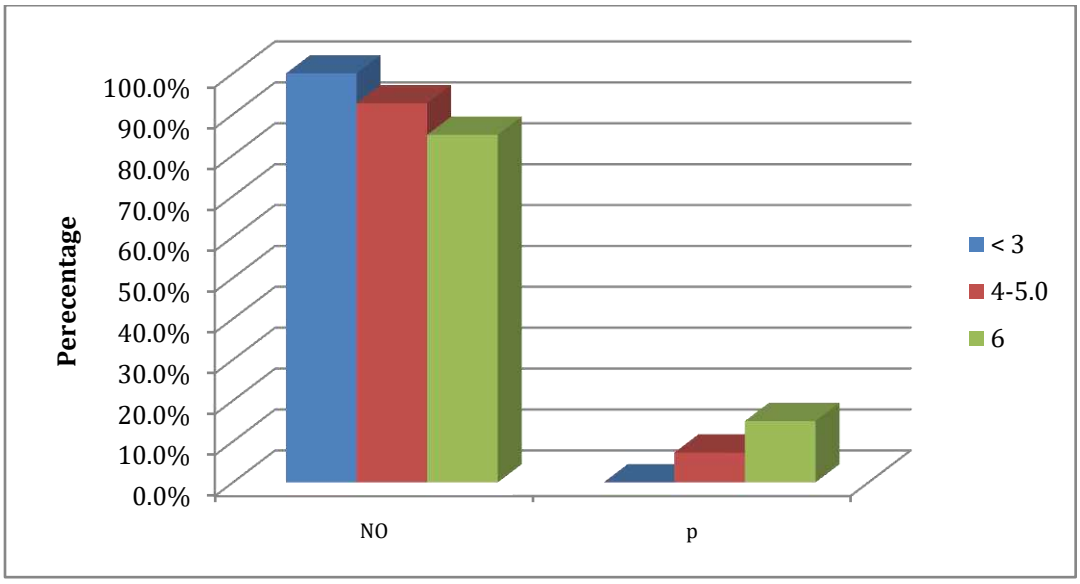


Figure 28: Influence of presence of hydrocephalus on outcome of hemorrhagic stroke as assessed by mRS at 60 days follow up

At 60 days follow up, among 7 patients with hydrocephalus, all were having poor outcome with everyone having mRS score ≥4. Four patients had mRS score between 4-5 (bed bound) and 3 patients died at the end of 60 days (mRS score 6) but P value is 0.146,so the Influence of presence of hydrocephalus on outcome of hemorrhagic stroke (as assessed by mRS) at 60 days follow up is not statistically significant.

7. Smoking And Alcohol

In our study, out of 100 patients, 15% were alcoholics and 4% were smokers

Table 34 : Alcohol in patients with acute hemorrhagic stroke

Alcoholic	No. of cases	Percentage
NO	85	85.0%
YES	15	15.0%
Total	100	100.0%

Table 35: Smoking in patients with acute hemorrhagic stroke

Smoker	No. of cases	Percentage
NO	96	96.0%
YES	4	4.0%
Total	100	100.0%

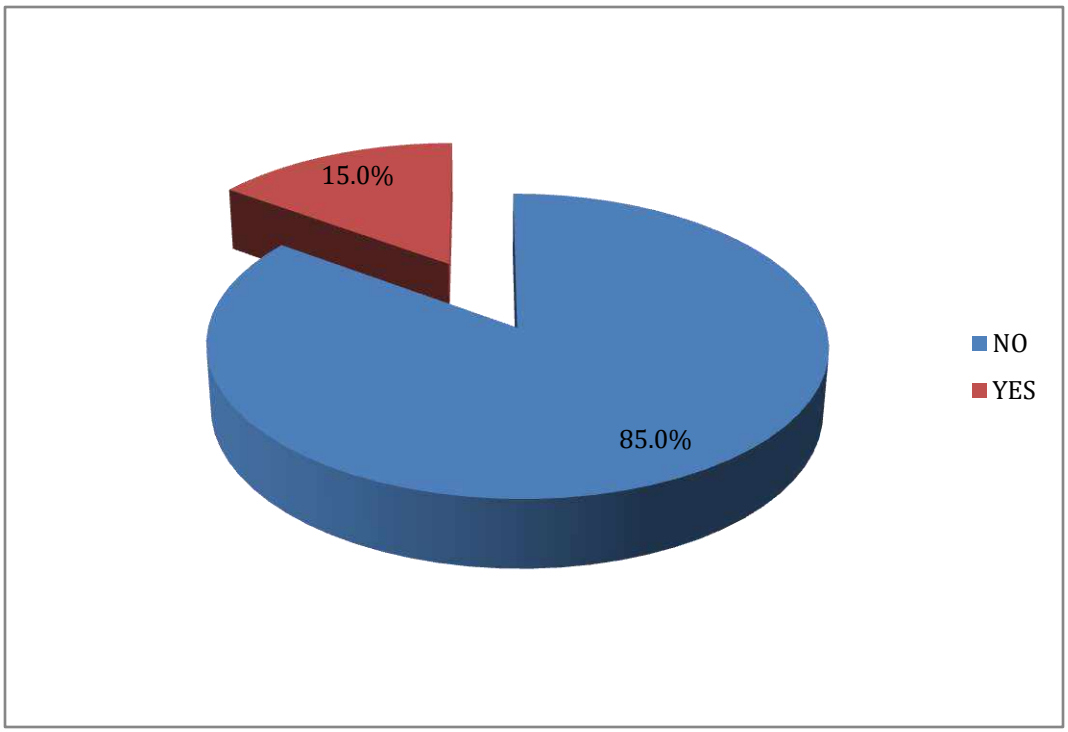


Figure 29: Alcohol in patients with acute hemorrhagic stroke

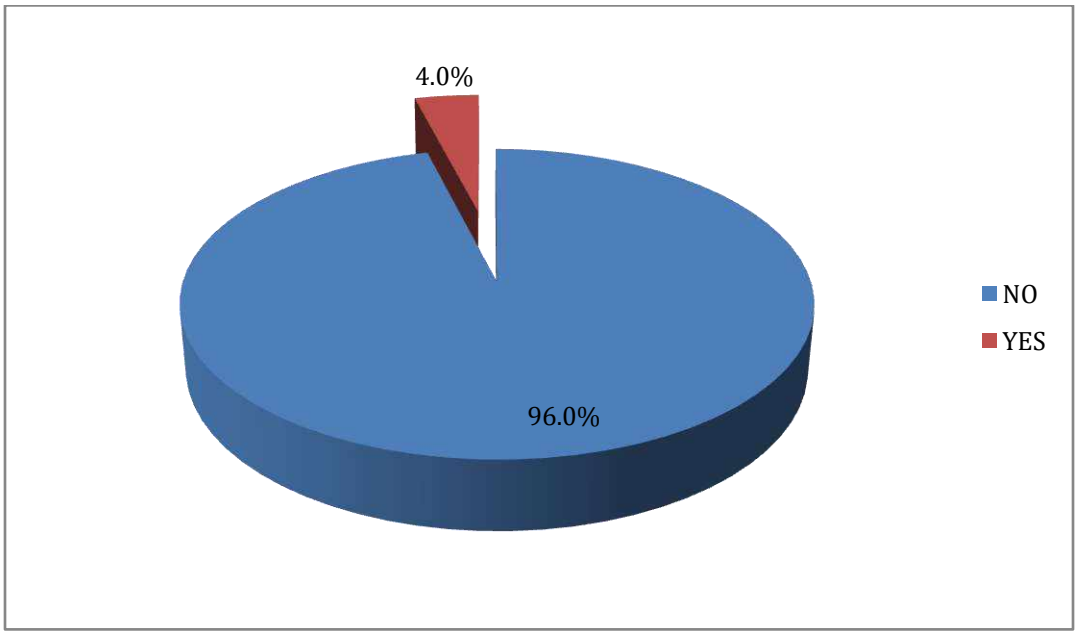


Figure 30: Smoking in patients with acute hemorrhagic stroke

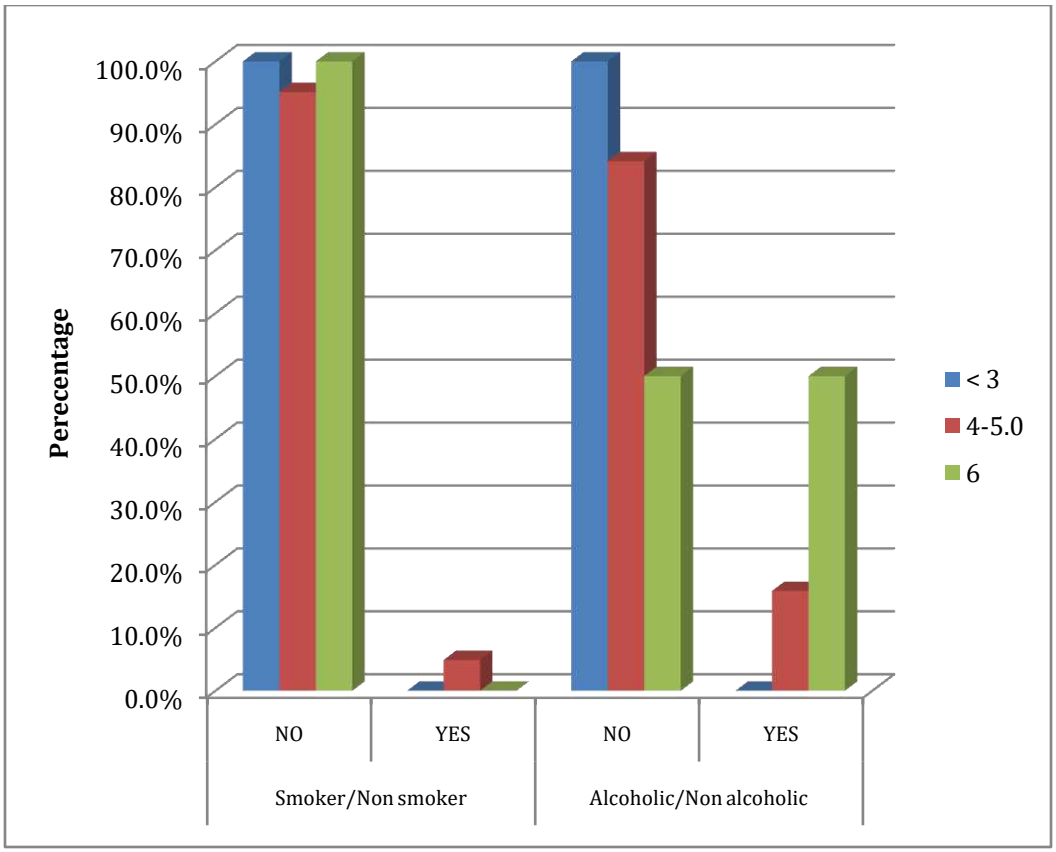


Figure 31: Influence of smoking and alcohol on outcome of hemorrhagic stroke as assessed by mRS at the time of discharge from the hospital

Table 36: Influence of alcohol on outcome of hemorrhagic stroke as assessed by mRS at discharge from the hospital

		mRS- group						Total	Chi-square value	p-value
		≤ 3		4-5		6				
Alcoholic	NO	14	100.0%	69	84.1%	2	50.0%	85	6.361	0.042
	YES	0	0.0%	13	15.9%	2	50.0%	15		
Total		14	100.0%	82	100.0%	4	100.0%	100		

In our study, all the alcoholics had poor outcome (all having mRS score≥4) with 13 having mRS score between 4-5 (bed bound) at the time of discharge and 2 dying during the course of hospital stay (mRS score 6).

P value is 0.042, so the influence of alcoholon outcome of hemorrhagic strokeas assessed by modified rankin score (mRS) at discharge is statistically significant indicating alcohol is a risk factor in our study for poor future outcome in acute hemorrhagic stroke patients.

Table 37: Influence of smoking on outcome of hemorrhagic stroke as assessed by mRS at discharge from the hospital

		mRS- group						Total	Chi-square value	p-value
		≤ 3		4-5		6				
Smoker	NO	14	100.0%	78	95.1%	4	100.0%	96	0.915	0.633
	YES	0	0.0%	4	4.9%	0	0.0%	4		

In our study, out of 4 smokers, all had mRS score between 4-5 (bed bound) at the time of discharge but p value is 0.633, so the Influence of smoking on outcome of hemorrhagic stroke as assessed by mRS at discharge is not statistically significant.

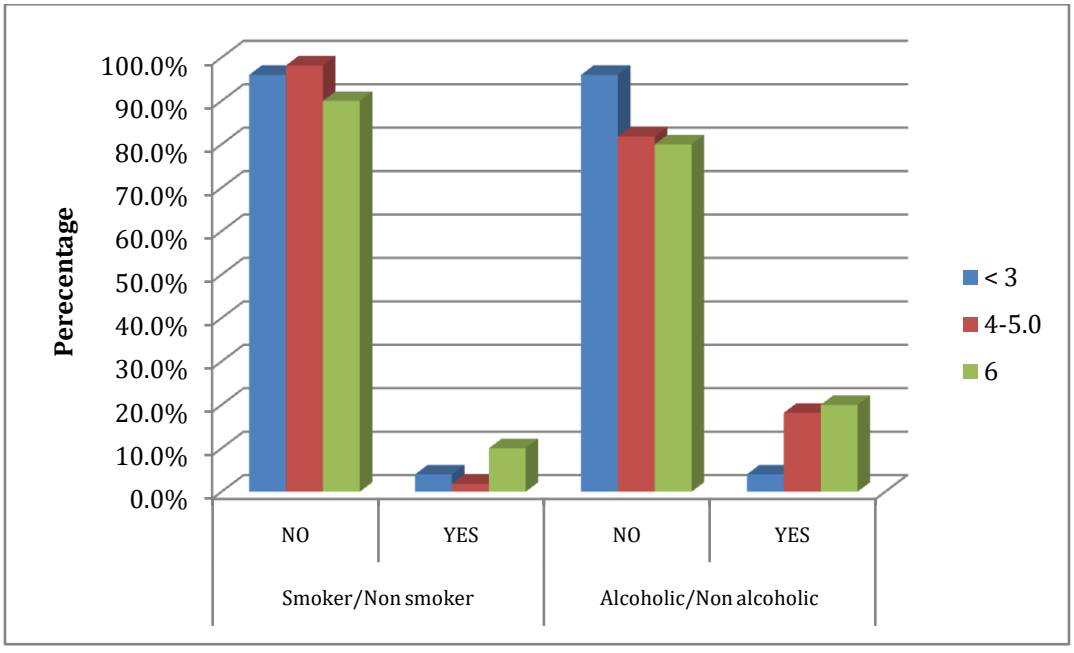


Figure 32: Influence of smoking and alcohol on outcome of hemorrhagic stroke as assessed by mRS at 60 days follow up

Table 38: Influence of alcohol on outcome of hemorrhagic stroke as assessed by mRS at 60 days follow up

		mRS- group 60 days						Total	Chi-square value	p-value
		≤ 3		4-5		6				
Alcoholic	NO	24	96.0%	45	81.8%	16	80.0%	85	0.320	0.202
	YES	1	4.0%	10	18.2%	4	20.0%	15		
Total		25	100.0%	55	100.0%	20	100.0%	100		

At 60 days follow up, out of 15 alcoholics, 1 had mRS score≤3, 10 had score between 4-5 and 4 died at the end of 60 days (mRS score 6).

P value is 0.202, so the influence of alcohol on outcome of hemorrhagic stroke as assessed by modified rankin score (mRS) at 60 days follow up is not statistically significant.

Table 39: Influence of smoking on outcome of hemorrhagic stroke as assessed by mRS at 60 days follow up

		mRS- group 60 days						Total	Chi-square value	p-value
		≤ 3		4-5		6				
Smoker	NO	24	96.0%	54	98.2%	18	90.0%	96	2.557	0.278
	YES	1	4.0%	1	1.8%	2	10.0%	4		

At 60 days follow up, out of 4 smoker 1 had mRS score≤3, 1 had score between 4-5 and 2 died at the end of 60 days (mRS score 6).

P value is 0.278, so the Influence of smoking on outcome of hemorrhagic stroke as assessed by mRS at 60 days follow up is not statistically significant.

8. Anticoagulants and Antiplatelets

In our study out of 100, one patient was on anticoagulant (for Atrial fibrillation) and 11 patients were on antiplatelets with 3 on dual antiplatelets and 8 patients on single antiplatelet.

Table 40: Use of anticoagulants in patients with acute hemorrhagic stroke.

Anticoagulants	No. of cases	Percentage
No	99	99.0%
Yes (on Acenocoumarol)	1	1.0%
Total	100	100.0%

Table 41: Use of antiplatelets in patients with acute hemorrhagic stroke.

Antiplatelets	No. of cases	Percentage
No	89	89.0%
Yes(on dual antiplatelets)	3	3.0%
Yes(on single antiplatelet)	8	8.0%
Total	100	100.0%

Table 42: Influence of use of oral anticoagulants and antiplatelets on outcome of hemorrhagic stroke as assessed by mRS at discharge

		mRS- group						Total	Chi-square value	p-value
		≤ 3		4-5		6				
Anticoagulants	No	14	100.0%	81	98.8 %	4	100.0%	99	0.222	0.895
	Yes (on Acenocoumarol)	0	0.0%	1	1.2 %	0	0.0%	1		
Total		14	100.0%	82	100.0%	4	100.0%	100		

		mRS- group						Total	Chi-square value	p-value
		≤ 3		4-5		6				
Antiplatelets	No	14	100.0%	72	87.8 %	3	75.0%	89	3.545	0.471
	Yes(on dual antiplatelets)	0	0.0%	3	3.7%	0	0.0%	3		
	Yes(on single antiplatelet)	0	0.0%	7	8.5%	1	25.0%	8		
Total		14	100.0%	82	100.0 %	4	100.0%	100		

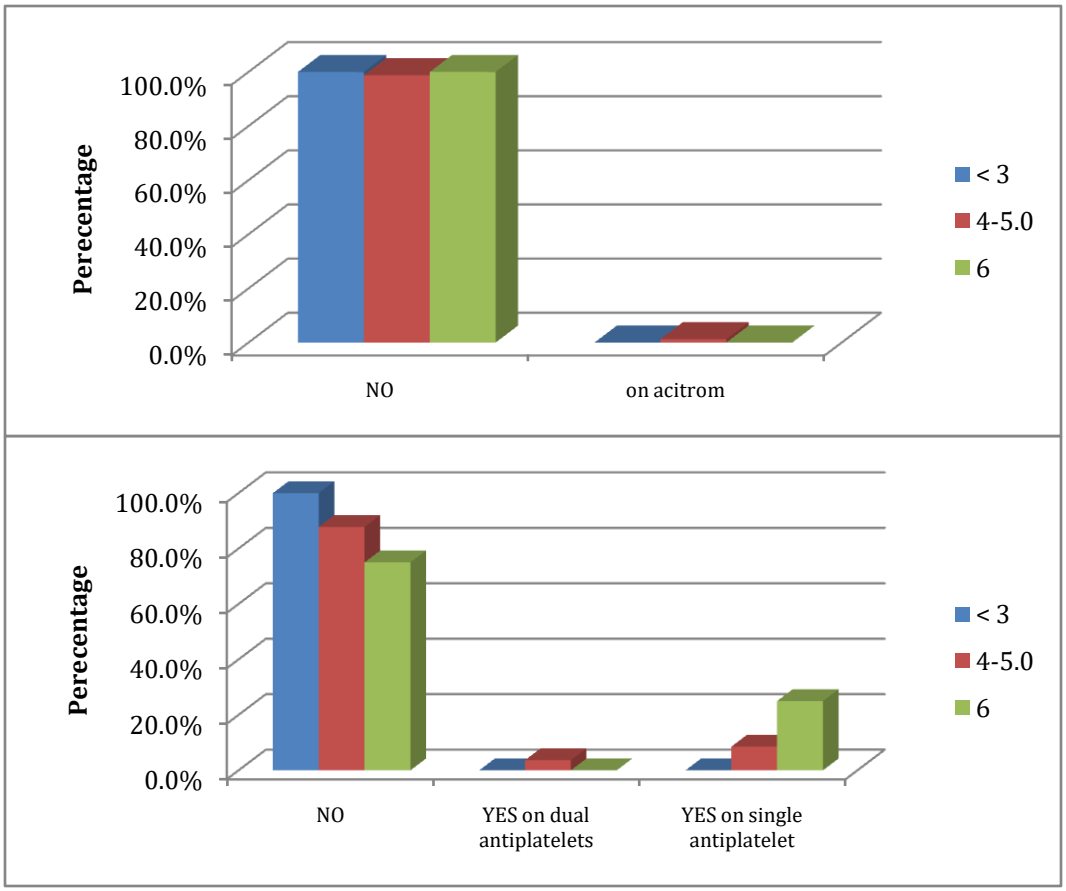


Figure 33: Influence of use of oral anticoagulants and antiplatelets on outcome of hemorrhagic stroke as assessed by mRS at discharge

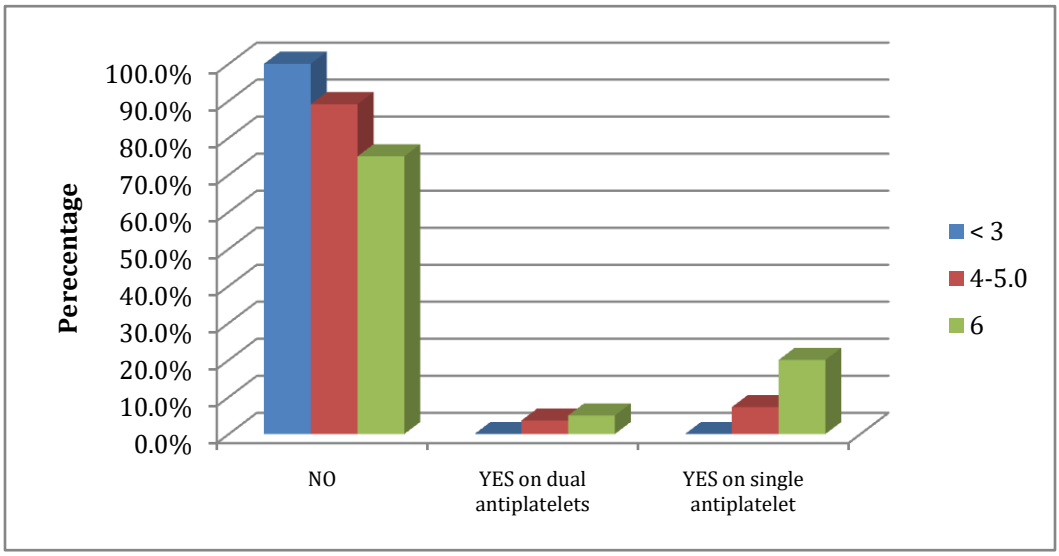
In our study, the only patient on oral anticoagulant had mRS score between 4-5 (bed bound) at discharge- poor outcome, however, p value is 0.895, so the influence of use of oral anticoagulants on outcome of hemorrhagic stroke (as assessed by mRS) at discharge is not statistically significant.

Out of 100 patients, 11 were on antiplatelets in our study, of which 3 patients were on dual antiplatelets and 8 were on single antiplatelets. At discharge, all were having poor outcome (mRS score ≥4) with 10 having mRS score between 4-5 (bed bound) at discharge and 1 dying during the course of hospital stay (mRS score 6) but the p value is 0.471, indicating that the Influence of use of antiplatelets on outcome of hemorrhagic stroke (as assessed by mRS) at discharge is not statistically significant

Table 43: Influence of use of oral anticoagulants and antiplatelets on outcome of hemorrhagic stroke as assessed by mRS at 60 days follow up

		mRS- group 60 days						Total	Chi-square value	p-value
		≤ 3		4-5		6				
Anticoagulants	No	25	100.0%	55	100.0%	19	95.0%	99	4.040	0.133
	Yes (on Acenocoumarol)	0	0.0%	0	0.0%	1	5.0%	1		
Total		25	100.0%	55	100.0%	20	100.0 %	100		

		mRS- group 60 days						Total	Chi-square value	p-value
		≤ 3		4-5		6				
Antiplatelets	No	25	100.0%	49	89.1%	15	75.0%	89	7.508	0.111
	Yes(on dual antiplatelets)	0	0.0%	2	3.6%	1	5.0%	3		
	Yes(on single antiplatelet)	0	0.0%	4	7.3%	4	20.0%	8		
Total		25	100.0%	55	100.0%	20	100.0 %	100		



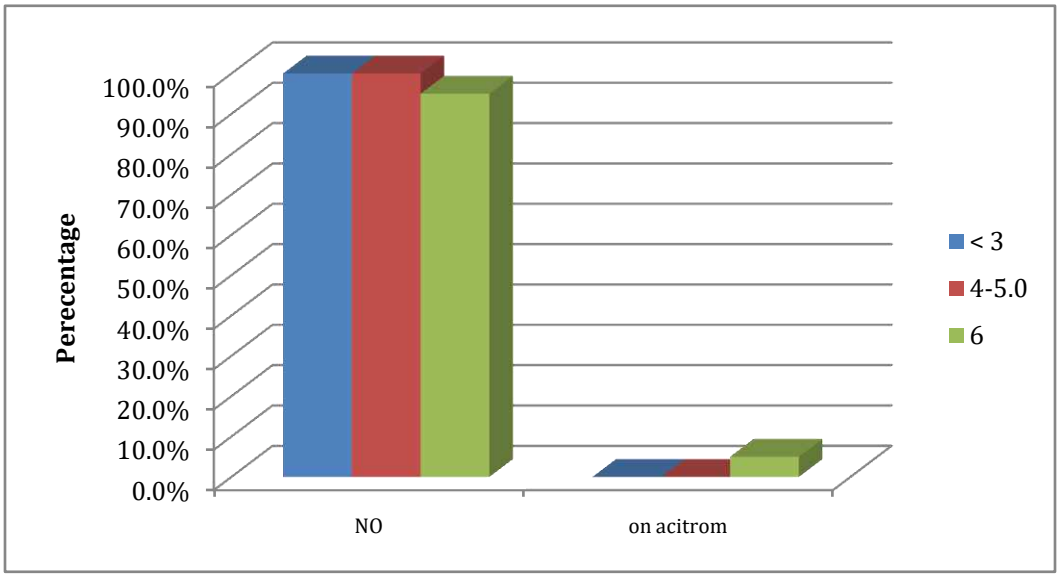


Figure 34: Influence of use of oral anticoagulants and antiplatelets on outcome of hemorrhagic stroke as assessed by mRs at 60 days follow up

In our study, the only patient on oral anticoagulant died at the end of 60 days (mRS score 6)- poor outcome, however, the p value is 0.133, so the influence of use of anticoagulants on outcome of hemorrhagic stroke (as assessed by mRs) at 60 days follow up is not statistically significant.

Out of 100, 11 patients were on antiplatelets in our study, of which 3 were on dual antiplatelets and 8 on single antiplatelets. At the end of 60 days, all were having poor outcome (mRS score>=4) with 6 having mRS score between 4-5 (bed bound) and 5 patients dying at the end of 60 days (mRS score 6), but the p value is 0.111, indicating the Influence of use of antiplatelets on outcome of hemorrhagic stroke (as assessed by mRs) at 60 days follow up is not statistically significant.

9. Hypertension

In our study out of 100 patients, 81 (81%) were known hypertensives and 19 had no history of hypertension. Among 19 patients, 10 were newly detected hypertensives. Out of 81 known hypertensives, 33 patients were not on regular treatment.

The maximum systolic blood pressure was 280mmhg and minimum was 90mmhg. Mean systolic pressure was 167.5mmhg. The maximum diastolic pressure was 190mmhg and minimum was 50mmhg. Mean diastolic pressure was 94.7mmhg. The maximum mean arterial pressure was 220mmhg, minimum was 63mmhg and mean was 119mmhg.

Table 44: Influence of hypertension on outcome of hemorrhagic stroke (as assessed by mRS) at the time of discharge from the hospital

		mRS- group						Total	Chi-square value	p-value
		≤ 3		4-5		6				
HTN	No	3	21.4%	14	17.1%	2	50.0%	19	3.816	0.431
	Yes	11	78.6%	68	82.9%	2	50.0%	81		

Of 81 known hypertensives in our study, 11 had mRS score ≤3 at discharge, 68 patients had score between 4-5 (bed bound) and 2 patients died during the course of hospital stay (mRS score 6).

P value is 0.431, so the influence of hypertension on outcome of hemorrhagic stroke (as assessed by mRS) at discharge is not statistically significant.

Table 45: Influence of hypertension on outcome of hemorrhagic stroke (as assessed by mRS) at 60 days follow up

		mRS- group 60 days						Total	Chi-square value	p-value
		≤ 3		4-5		6				
HTN	NO	6	24.0%	7	12.7%	6	30.0%	19	7.455	0.114
	YES	19	76.0%	48	87.3%	14	70.0%	81		

At 60 days follow up, among 81 hypertensives, 19 had mRS score ≤3, 48 had score between 4-5 and 14 patients died at the end of 60 days (mRS score 6).

P value is 0.114, so the influence of hypertension on outcome of hemorrhagic stroke (as assessed by mRS) at 60 days follow up is not statistically significant.

In our study no significant correlation was found between hypertension and future outcome as assessed by mRSscore at discharge and 60 days follow up in acute hemorrhagic stroke patients.

10. Diabetes Mellitus

In our study, 28 percent of patients were found to have preexisting diabetes mellitus.

Table 46: Influence of diabetes mellitus on outcome of hemorrhagic stroke (as assessed by mRS) at discharge

		mRS- group						Total	Chi-square value	p-value
		≤ 3		4-5		6				
Dm	NO	12	85.7%	58	70.7%	2	50.0%	72	2.332	0.312
	YES	2	14.3%	24	29.3%	2	50.0%	28		

Out of 28 known diabetics in our study, 2 had mRS score ≤3 at discharge, 24 had score between 4-5 and 2 patients died during the course of hospital stay (mRS score 6).

P value 0.312 signifies no influence of diabetes mellitus on outcome of hemorrhagic stroke (as assessed by mRS) at discharge.

Table 47: Influence of diabetes mellitus on outcome of hemorrhagic stroke (as assessed by mRS) at 60 days follow up

		mRS- group 60 days						Total	Chi-square value	p-value
		≤ 3		4-5		6				
Dm	NO	21	84.0%	39	70.9%	12	60.0%	72	3.247	0.197
	YES	4	16.0%	16	29.1%	8	40.0%	28		

At 60 days follow up among diabetics, 4 had mRS score≤3, 16 had score between 4-5 and 8 patients died at the end of 60 days (mRS score 6).

P value 0.197 signifies no Influence of diabetes mellitus on outcome of hemorrhagic stroke (as assessed by mRS) at 60 days follow up.

11. Chronic Kidney Disease (CKD)

In our study, 14% of patients were found to have underlying CKD.

Table 48: Influence of CKD on outcome of hemorrhagic stroke (as assessed by mRS) at discharge

		mRS- group						Total	Chi-square value	p-value
		≤ 3		4-5		6				
CKD	NO	13	92.9%	69	84.1%	4	100.0%	86	1.432	0.489
	YES	1	7.1%	13	15.9%	0	0.0%	14		

In our study among 14 patients with underlying CKD, at discharge, 1 had mRS score≤3, 13 had score between 4-5 and no patient died during the course of hospital stay.

P value 0.489 signifies no influence of CKD on outcome of hemorrhagic stroke (as assessed by mRS) at discharge.

Table 49: Influence of CKD on outcome of hemorrhagic stroke (as assessed by mRS) at 60 days follow up

		mRS- group 60 days						Total	Chi-square value	p-value
		≤ 3		4-5		6				
CKD	NO	22	88.0%	50	90.9%	14	70.0%	86	5.436	0.066
	YES	3	12.0%	5	9.1%	6	30.0%	14		

At 60 days follow up, out of 14 CKD patients, 3 had mRS score ≤3, 5 had score between 4-5 and 6 patients died at the end of 60 days.

P value 0.066 signifies no influence of CKD on outcome of hemorrhagic stroke (as assessed by mRS) at 60 days follow up.

12. **Chronic Liver Disease (CLD)**

Out of 100 patients, 7 percent were found to have underlying CLD.

Table 50: Influence of CLD on outcome of hemorrhagic stroke (as assessed by mRS) at discharge

		mRS- group						Total	Chi-square value	p-value
		≤ 3		4-5		6				
CLD	NO	14	100.0%	77	93.9%	2	50.0%	93	12.517	0.002
	YES	0	0.0%	5	6.1%	2	50.0%	7		
Total		14	100.0%	82	100.0%	4	100.0%	100		

Out of 7 patients having underlying CLD, all had poor outcome at discharge with 5 having mRS score between 4-5 (bed bound) and 2 patients dying during the course of hospital stay (mRS score 6).

P value 0.002 signifies, influence of CLD on outcome of hemorrhagic stroke (as assessed by mRS) at discharge is statistically significant. Patients with underlying CLD were associated with higher mRS score at discharge, havinghigh morbidity and mortality indicating CLD is a risk factor in our study, i.e presence of CLD is consistent with poor future outcome in patients with acute hemorrhagic stroke.

13. Coronary Artery Disease (CAD)

Out of 100 patients in our study, 10 were found to have underlying CAD.

Table 51: Influence of CAD on outcome of hemorrhagic stroke (as assessed by mRS) at 60 days follow up

		mRS- group 60 days						Total	Chi-square value	p-value
		≤ 3		4-5		6				
CAD	NO	25	100.0%	51	92.7%	14	70.0%	90	12.121	0.002
	YES	0	0.0%	4	7.3%	6	30.0%	10		

Out of 10 patients having underlying CAD, all had poor outcome at the end of 60 days with 4 having mRS score between 4-5 and 6 patients dying at the end of 60 days (mRS score 6).

P value is 0.002, so the influence of CAD on outcome of hemorrhagic stroke (as assessed by mRS) at 60 days follow up is statistically significant. We found that patients with underlying CAD were associated with higher mRS score at the end of 60 days follow up having higher morbidity and mortality.

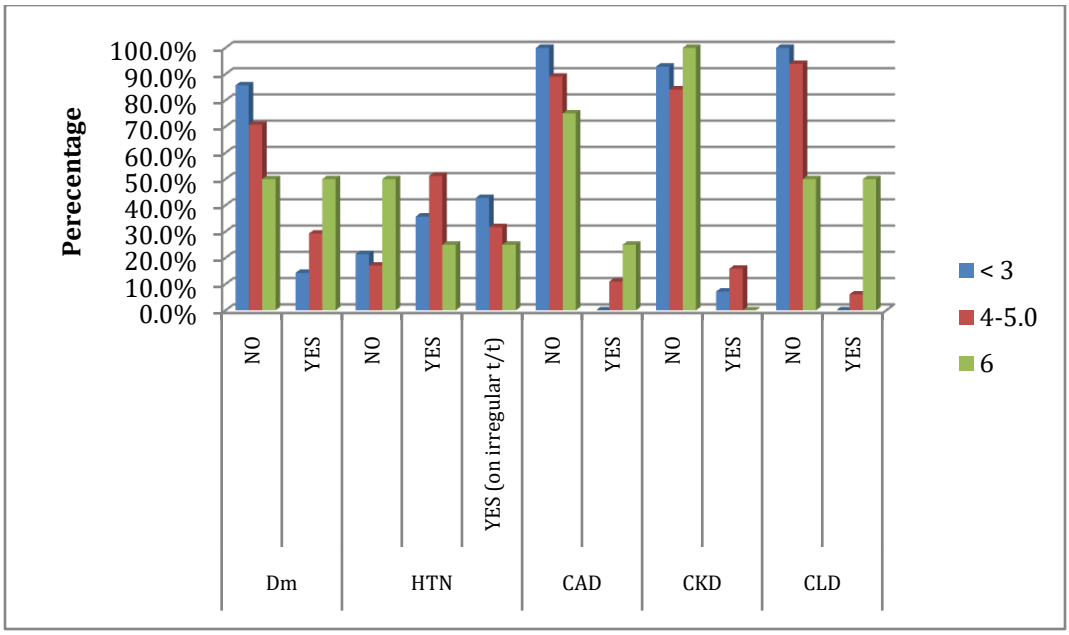


Figure 35: Influence of DM, HTN, CKD, CAD and CLD on outcome of hemorrhagic stroke as assessed by mRS at discharge

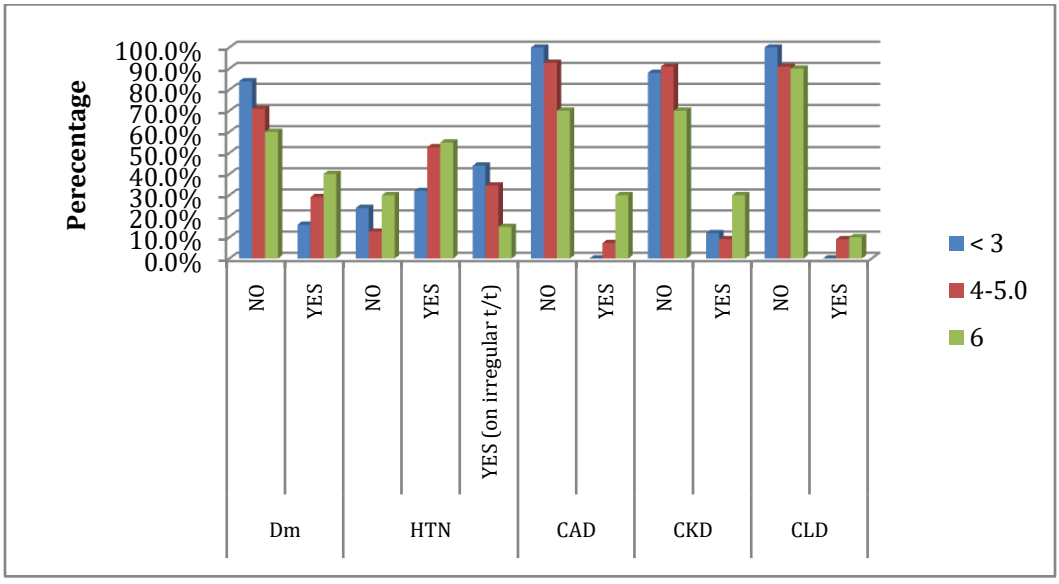


Figure 36: Influence of DM, HTN, CKD, CAD and CLD on outcome of hemorrhagic stroke as assessed by mRS at 60 days follow up

14. Coagulopathy

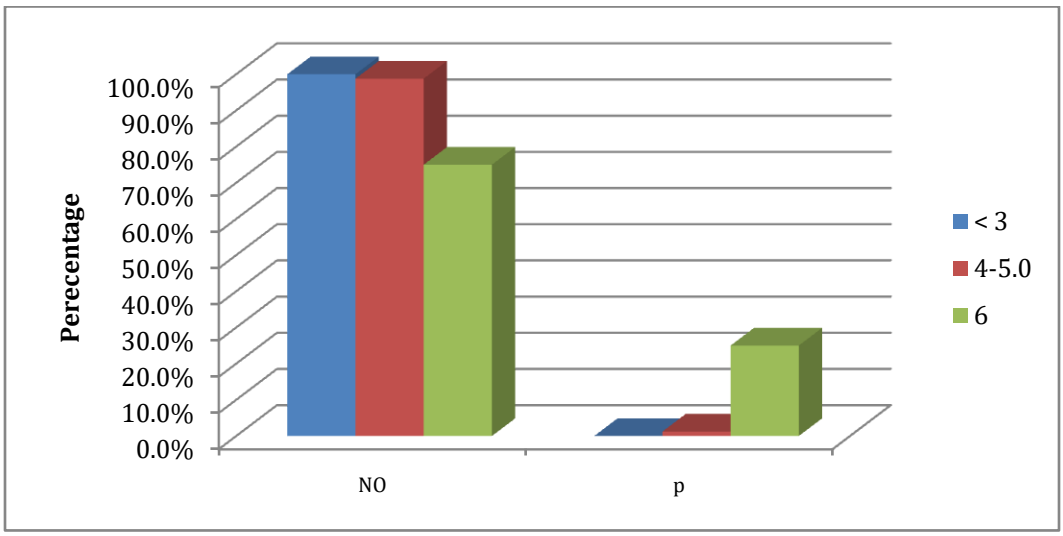
Out of 100 patients in our study, 2 were having underlying coagulopathy related bleed. Both the patients were having underlying CLD related coagulopathy. Mostly coagulopathy bleed is atypical/cortical (lobar) bleed. In our study among 2 patients with coagulopathy, one had gangliothalamic bleed and the other had lobar bleed.

Table 52: Site of bleed in patients with coagulopathy

		Site of bleed (gangliocapsular-1, Thalamic - 2, cerebellum - 3, Pontine/brainstem - 4, cortical/atypical - 5)								Total	Chi-square value	p-value
		1	1 and 2	1,2 and 4	2	2 and 4	3	4	5			
Coagulopathy	Absent	38	17	4	1	2	7	2	27	98	2.616	0.918
	Present	0	1	0	0	0	0	0	1	2		

Table 53: Influence of coagulopathy on outcome of hemorrhagic stroke (as assessed by mRS) at discharge

		mRS- group						Total	Chi-square value	p-value
		≤ 3		4-5		6				
Coagulopathy	Absent	14	100.0%	81	98.8%	3	75.0%	98	11.336	0.003
	Present	0	0.0%	1	1.2%	1	25.0%	2		
Total		14	100.0%	82	100.0%	4	100.0%	100		



Graph 37: Influence of coagulopathy on outcome of hemorrhagic stroke (as assessed by mRS) at discharge

Both the patients with coagulopathy related bleed, had poor outcome at discharge with one patient having mRS score between 4-5 (bed bound) and the other died during the course of hospital stay (mRS score 6).

P value 0.003 signifies the Influence of coagulopathy on outcome of hemorrhagic stroke (as assessed by mRS) at discharge is statistically significant. We found that patients with underlying coagulopathy related bleedare associated with higher mRS score at discharge, having high morbidity and mortality.

ATYPICAL BLEED

In our study, out of 100 patients, CT Angiography with venous cuts was done in 17 patients, and 3 patients had aneurysmal bleed, 4 had AV malformation, 1 had cortical venous thrombosis and the imaging was normal in 9 patients.

Table 54: Causes in patients with atypical bleed

CT Angio with venous cuts	No. of cases	Percentage
Aneurysm present	3	3.0%
AV malformation present	4	4.0%
Cortical venous thrombosis	1	1.0%
Normal	9	9.0%
Not done	83	83.0%
Total	100	100.0%

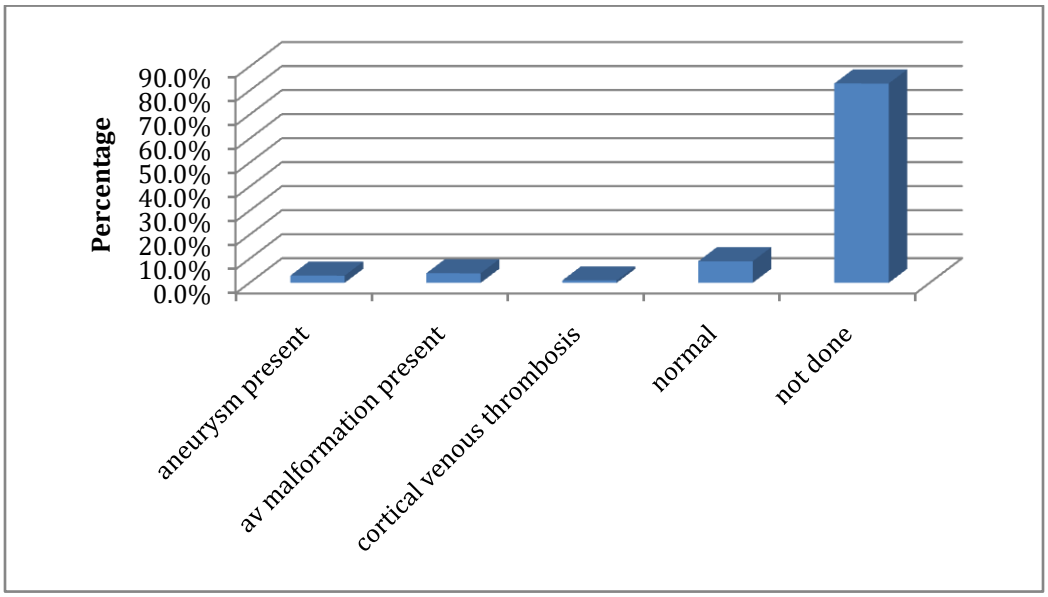


Figure 38: Causes of bleed in patients with atypical bleed

Table 55: Influence of presence of AV malformation/aneurysmal bleed/cortical vein thrombosis on outcome of hemorrhagic stroke (as assessed by mRS) at discharge

		mRS- group						Total	Chi-square value	p-value
		≤ 3		4-5		6				
CT Angio with venous cuts	AV malformation present	1	7.1%	3	3.7%	0	0.0%	4	29.218	0.001
	Aneurysm present	0	0.0%	3	3.7%	0	0.0%	3		
	Cortical venous thrombosis	0	0.0%	0	0.0%	1	25.0%	1		
	Normal	3	21.4%	6	7.3%	0	0.0%	9		
	Not done	10	71.4%	70	85.4%	3	75.0%	83		
Total		14	100.0%	82	100.0%	4	100.0%	100		

In our study, out of 100 patients, 4 were having AV malformation and at discharge, only 1 patient had mRS score≤3 while 3 patients had mRS score between 4-5 (bed bound) and no-one died during the course of hospital stay.

Out of 3 patients having aneurysmal bleed, all had mRS score between 4-5 (bed bound) at discharge.

The only patient with cortical vein thrombosis died during the course of hospital stay (mRS score 6).

P value 0.001 indicates the influence of presence of AV malformation/aneurysmal bleed/cortical vein thrombosis on outcome of hemorrhagic stroke at the time of discharge is statistically significant.

Table 56: Influence of presence of AV malformation/aneurysmal bleed/cortical vein thrombosis on outcome of hemorrhagic stroke (as assessed by mRS) at 60 days follow up

		mRS- group 60 days						Total	Chi-square value	p-value
		≤3		4-5		6				
CT Angio with venous cuts	AV malformation present	1	4.0%	2	3.6%	1	5.0%	4	15.782	0.103
	Aneurysm present	1	4.0%	1	1.8%	1	5.0%	3		
	Cortical venous thrombosis	0	0.0%	0	0.0%	1	5.0%	1		
	Normal	6	24.0%	3	5.5%	0	0.0%	9		
	Not done	17	68.0%	49	89.1%	17	85.0%	83		
Total		25	100.0%	55	100.0%	20	100.0%	100		

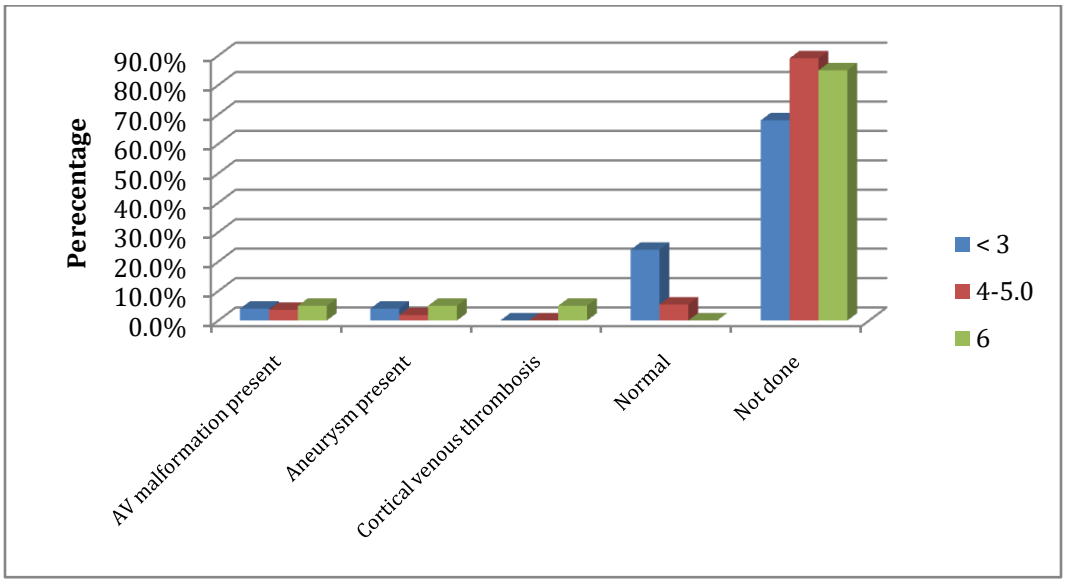


Figure 39: Influence of presence of av malformation/aneurysmal bleed/cortical vein thrombosis on outcome of hemorrhagic stroke (as assessed by mRS) at 60 days follow up

At 60 days follow up out of 4 patients with AV malformation, 1 had mRS score ≤3 , 2 patients had score between 4-5 and the one died at the end of 60 days (mRS score 6)

Among 3 patients with aneurysmal bleed, one had mRS score ≤3, one had score between 4-5 and one died at the end of 60 days (mRS 6)

P value of 0.103 indicates the influence of AV malformation/aneurysm/cortical vein thrombosis on outcome of hemorrhagic stroke as assessed by mRS at the end of 60 days is not statistically significant.

NEUROSURGICAL INTERVENTION

In our study, 23 out of 100 patients underwent neurosurgical intervention which accounted to 23% of the group.

Table 57: Neurosurgical intervention in patients with acute hemorrhagic stroke

Surgery	No. of cases	Percentage
No	77	77.0%
Yes	23	23.0%
Total	100	100.0%

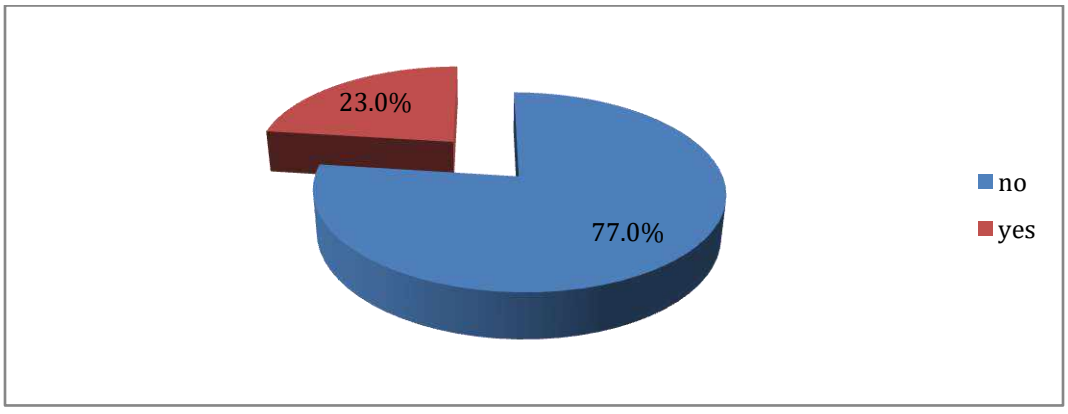


Figure 40: Neurosurgical intervention in patients with acute hemorrhagic stroke

Table 58: Influence of neurosurgical intervention on outcome of hemorrhagic stroke as assessed by mRS at discharge, 30 days and 60 days follow up

		Surgery				Total	Chi-square value	p-value
		No		Yes				
mRS-group at discharge	≤ 3	12	15.6%	2	8.7%	14	2.248	0.325
	4-5	63	81.8%	19	82.6%	82		
	6	2	2.6%	2	8.7%	4		
mRS- at 30 days follow up	≤ 3	15	19.5%	2	8.7%	17	1.461	0.482
	4-5	47	61.0%	16	69.6%	63		
	6	15	19.5%	5	21.7%	20		
mRS- at 60 days follow up	≤ 3	22	28.6%	3	13.0%	25	2.320	0.313
	4-5	40	51.9%	15	65.2%	55		
	6	15	19.5%	5	21.7%	20		

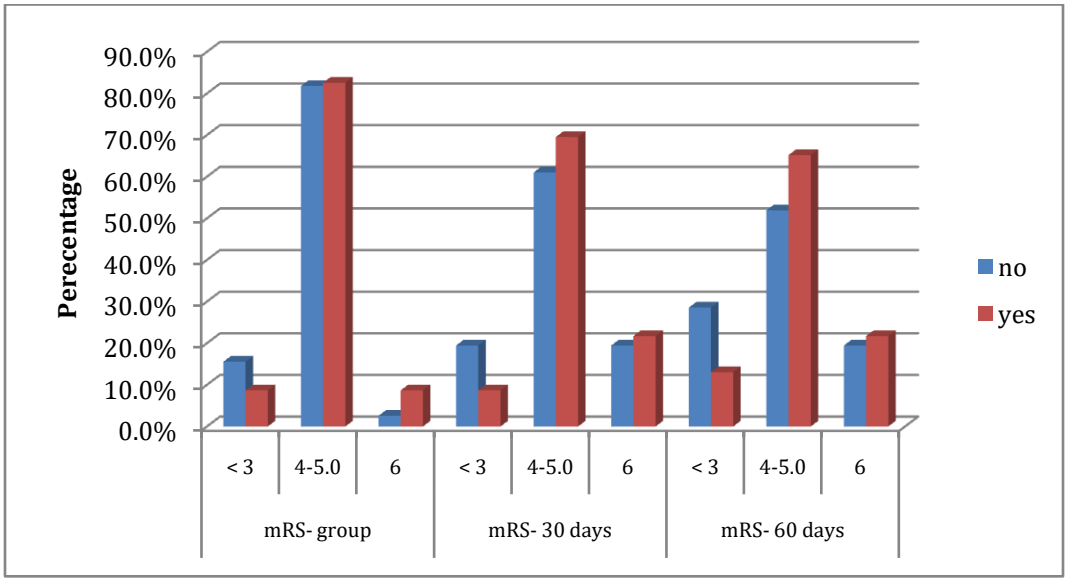


Figure 41: Influence of neurosurgical intervention on outcome of hemorrhagic stroke as assessed by mRS at discharge, 30 days and 60 days follow up

Out of 23 patients undergoing neurosurgical intervention, at discharge, 2 (8.7%) patients had mRS score≤3, 19 (82.6%) had mRS score between 4-5 and 2 (8.7%) patients died during the course of the hospital stay (mRS score 6).

At 30 days follow up, 2 (8.7%) patients had mRS score≤3, 16 (69.6%) had mRS score between 4-5 and 5 (21.7%) patients died at the end of 30 days (mRS score 6).

At 60 days follow up, 3 (13%) patients had mRS score≤3, 15 (65.2%) had mRS score between 4-5 and 5 (21.7%) patients died at the end of 60 days (mRS score 6).

In our study, patients undergoing neurosurgical intervention had higher morbidity and mortality with 15 patients out of 23 having mRS score 4-5 (bed bound) and 5 patients dying at the end of 60 days (mRS score 6) but p value is more than 0.05 so influence of neurosurgical intervention on outcome of hemorrhagic stroke as assessed by mRS at discharge, 30 days and 60 days follow up is not statistically significant.

MODIFIED RANKIN SCORE (mRS)

The patients were evaluated on their last day in the hospital for the outcome and were followed up at 30 and 60 days using the Modified Rankin Score based on the functional ability and graded from 0 (no disability) to 6 (death) with increasing disability on the scale.

Table 59: mRS in patients admitted with hemorrhagic stroke

mRS-group	At Discharge		30 days		60 days	
	No. of cases	Percentage	No. of cases	Percentage	No. of cases	Percentage
≤3	14	14.0%	17	17.0%	25	25.0%
4-5	82	82.0%	63	63.0%	55	55.0%
6	4	4.0%	20	20.0%	20	20.0%
Total	100	100.0%	100	100.0%	100	100.0%

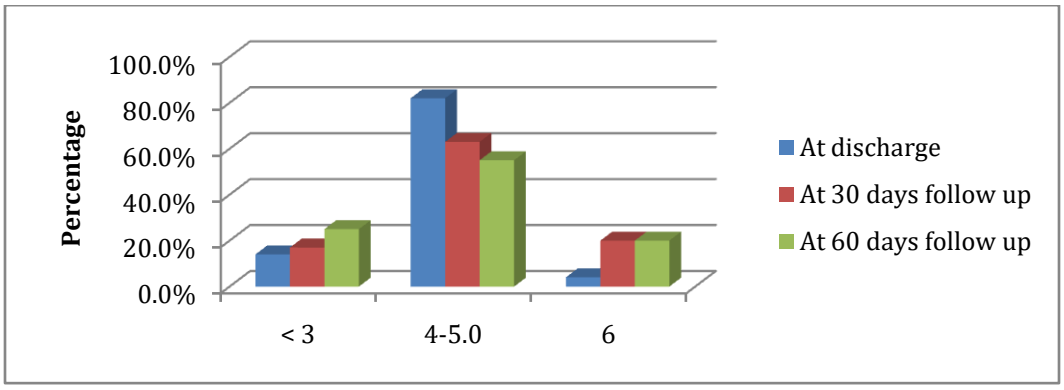


Figure 42: mRS in patients admitted with hemorrhagic stroke

At the time of discharge from the hospital, 14 patients had mRS score ≤3, 82 had between 4-5 and 4 patients died during the course of hospital stay.

At 30 days follow up, 17 patients had mRS score ≤3, 63 had between 4-5 and 20 patients died at the end of 30 days.

At 60 days follow up, 25 patients had mRS score ≤3, 55 had between 4-5 and 20 patients died at the end of 60 days

DISCUSSION

Acute intracerebral hemorrhage is one of the common causes of stroke and is a grave medical emergency of the highest degree with frequent early neurological deterioration or death. Accurate prediction of outcome after acute ICH is necessary to distinguish those patients who need special care or who would benefit from particular therapeutic strategies. The need to identify potential risk factors, initiate corrective measures, and customize treatment cannot be overemphasized, especially in resource limited setting as in India.

This study comprises of 100 patients with spontaneous intracerebral hemorrhage.

Age

Primary spontaneous intracerebral hemorrhage is considered to be a disease of the elderly. In our study of 100 patients, the age of the patients admitted with acute hemorrhagic stroke ranged from 17 years to 99 years with a mean age of 55.19 years, and nineteen patients (19%) were above 70 years in our group. The majority of the patients belonged to an age group of 51-70 years comprising 39% of the patients followed by the age group between 31-50 years (35% patients). This comparatively younger age of incidence has been reported uniformly across India and appears to be a characteristic feature of SICH in the Indian subcontinent. In our study mortality increased with increasing age with maximum mortality seen in the age group more than 70 years (31.6%) followed by age group between 51-70 years (17.9%). Several authors have shown that older adults with acute ICH experienced the worse outcomes compared with their younger counterparts, including death, dependency, and overall quality of life. Higher age has been reported as risk factors for ICH.[29] [34] Age-related degenerative changes in cerebral arteries increase the risk for rupture, but also for ischemic stroke.

Forti et al observed that Independent of pre-admission characteristics, hematoma location and time from symptom onset to admission CT-scan, oldest-old (75-84 years) subjects had the highest admission hematoma volume ($p < 0.01$). However age was unrelated to all other ICH characteristics including hematoma expansion. Risk of in hospital and 1-year mortality in elderly subjects with acute supratentorial ICH was not found to be different across age categories thereby questioning use of age as an independent criterion for stratification of mortality risk in elderly subjects with acute ICH.[115]

Interact 2 study found that ICH severity increased in categories of older age (P-trend 0.002). Stroke patients over 75 years old were four times more likely to die or be disabled at 90 days than those <52 years when other confounders were accounted for (odds ratio 4.36, 95% confidence interval 3.12–6.08).[116]

Our study did not indicate any association between ages on the outcome of hemorrhagic stroke. Age has been found to be an independent predictor of ICH outcome in some prior prediction models, while age has not been associated with outcome in others.[22] [75] [79] In the UCSF ICH cohort, only very old age (≥80 years) was associated with 30-day mortality.[80]

Gender

Among 100 patients enrolled in our study, 68(68%) were males and 32(32%) were females translating into male: female ratio of 2.1:1. This male sex predominance among stroke patients was noted in the findings of many other studies.[42] [47] This was similar to the study by Hseih et al where 58 percent of patients were males. The significance of gender predilection is unclear with some studies including by Minelli et al[117] and Lavados et al[118] reporting no difference in incidence among males and females.

In our study females had higher risk of mortality than males at discharge, 30 and 60 days follow up. Sex differences in neurological

outcome after ICH are emerging with varying results. Women may have worse early and late neurological outcomes. As women age, their risk of poor outcome seems to increase to a greater degree than in men. However, other studies find no sex difference in neurological outcome at 3 and 6 months after ICH

The pathophysiology is under investigation with possible role of estrogen as protective hormone[119] which also explains increased incidence in females after age of 80 years.[120]

Site of Bleed

In our study, 38 patients had gangliocapsular bleed, 28 had lobar bleed, 18 had thalmocapsular, 7 had cerebellar bleed, 4 had thalmocapsular with brainstem bleed, 2 had thalamic with brainstem bleed, 2 had only brainstem bleed and remaining 1 had only thalamic bleed.

The most common site of bleed in our study was gangliocapsular (38%) followed by lobar (28%). The least common site of bleed was thalamic (1%) followed by brainstem (2%). Gangliocapsular location as the most common location is similar to previous studies.[121-122] however lobar bleed as the 2nd most common site of bleed was deviant from previous studies which showed thalamic bleed as the 2nd most common site and lobar bleeds as unusual site of bleed.[123] However study by Tatu et al on Besancon registry showed the most common site of bleed to be lobar bleed.[124]

Side of Bleed

Out of 100 patients in our study, 49 (49%) had right sided bleed and 50 (50%) had left sided bleed with 1(1%) having b/l bleed.

It was found that females had right sided bleed (53%) more common as compared to left sided bleed (44%). 1 female patient had bilateral bleed. This propensity for right sided bleeds in females was similar to that found in study by Ganti et al.[125]

Clinical presentation

In our study, weakness is the commonest symptom at presentation in acute hemorrhagic stroke patients with 86% patients presented with weakness in one or more limbs, 44 percent of patients presented with vomiting, 32 percent of patients presented with headache and 7 percent patients presented with seizures. Headache, vomiting and seizure as presenting complaint was most commonly seen in lobar bleed.

Patients with ICH often have headache (36% versus 16% in IS) vomiting (29% versus 1-8% in IS), and decreased level of consciousness at admission (39% versus 13% in IS).[25] Previous studies have reported headache as the most common symptom with nearly 52% patients reporting headache in acute phase.[126] Headache has been reported more common in lobar and cerebellar hemorrhage than in deep ones. Headache is more common in patients with large hematomas, and is attributed to traction on meningeal pain fibres, increased intracranial pressure, or blood in the cerebrospinal fluid.[127] Headache is more common with ICH than with ischemic stroke, although less common than in subarachnoid hemorrhage.[128]

In the Harvard Stroke Registry, 49% of persons with a supratentorial ICH vomited compared with 2% of patients with ischemia in the carotid territory and 45% of patients with SAH. Vomiting occurs most commonly if posterior circulation is affected,

Seizures appear in approximately 10%-28% of all patients with ICH[129-130]. Nearly all seizures occur at the onset of bleeding or within the first days of ictus.[130] Seizures were most often focal with secondary generalization.[130]

Predictors of outcome

Glasgow Coma Scale (GCS)

The Glasgow coma score was used to ascertain the level of consciousness on admission and was graded as per severity.

A highly significant positive correlation was obtained in our study between the GCS on admission and outcome of hemorrhagic stroke. This was similar to study by Bhatia et al where increase in ICH was associated with worse clinical outcome.[2] According to Rathor et al., the mean GCS score was significantly higher among survivors. The prognostic value of low GCS and high NIHSS scores amongst SICH patients in others study probably reflects the mass effects of hematoma collection, intraventricular hemorrhage and intraventricular hematoma extension. In this study, 81% of ICH patients with GCS < 9 died in the acute phase of stroke.[131]

Volume of hematoma

The volume of the hematoma was calculated by the ABC/2 method from the baseline CT scan of the brain.

In our study, 57 out of 100 patients which accounted for 57% of the group had volume of bleed less than 30 CC (and were given score 0) and 43% had volume of bleed more than or equal to 30 cc (were given score 1)

A highly significant positive correlation was obtained in our study between volumes of hematoma on the baseline CT scan on outcome of hemorrhagic stroke. This was similar to that of a study of 30-day mortality rates based on ICH volume, Broderick et al found that as hemorrhage volume increased, the patients' 30-day mortality rates were significantly worse ($p < 0.0001$), indicating a strong predictive value of hemorrhage volume at presentation. Patients with a parenchymal hemorrhage volume of 60 cm3 or more on their initial computed tomogram and a Glasgow Coma Scale score of 8 or less had a predicted 30-day mortality of 91%. Patients with a volume of less

than 30 cm3 and a Glasgow Coma Scale score of 9 or more had a predicted 30-day mortality of 19%.[75] Salihovic included 75 patients with ICH and found that the best six-month survival was in patients with a volume up to 29 mL, 30 of them (64%) survived. The highest mortality rate was recorded in patients with the hematoma volume >60 mL (85%). Kaplan-Meier's analysis showed that there was statistical significance between the size of the hematoma and the six-month survival.[132] Studies of Godoy et al.[133] showed that mortality was higher in the groups with greater hematoma volume, which is similar to the results of our study. Castellanos et al. noted that the higher hematoma volume, deep localization, intraventricular spreading of hematoma, mass effect was significantly associated with a worse outcome. Daverat et al. and Lampl et al. showed that hematoma volume influenced short-term prognosis in patients with ICH, and it is similar with our study.[63] [134] Safatli et al found that a bleeding volume of more than 32 ml supratentorially and 21 ml infratentorially correlated with a poor short term outcome--when combined with an initial GCS of 11 or less.[135] Flemming et al. identified 40 ml as a critical volume predicting a poor outcome in his study with a population of patients with lobar hemorrhage.[136] In contrast, Hemphill et al. presented a volume of 30 ml as the cutoff value whereas Nilsson et al. described 60 ml as the cutoff point.[18] [137]

Location of Hematoma (Infratentorial origin)

Out of 100 patients included in our study, 25 patients had infratentorial location of hematoma and 75 had supratentorial location.

In our study patients with infratentorial location of hematoma had better future outcome but the results were not statistically significant. Similar findings were reported by Salihovic et al where the lowest mortality was in infratentorial hematoma (12.8%) but there was no statistical significance between the localization of the hematoma and the six-month outcome of patients. Similarly it was found that 30 day mortality

occurred in 50 percent of patients with supratentorial hematoma and 3 percent of patients with infratentorial location in a study by Godoy et al. [133] The findings of our study were similar to the previous studies.

Presence of Intraventricular Hemorrhage (Ivh)

Out of 100 patients in our study, 71 patients had presence of IVH.

A highly significant positive correlation was obtained in our study between presence of IVH and outcome of hemorrhagic stroke. Chan et al did a prospective study on 239 patients with ICH and found that Death or major disability occurred in 66% with IVH versus 49% in intracerebral hemorrhage–alone patients (adjusted odds ratio, 1.68; 95% confidence interval, 1.38–2.06; $P<0.01$). The path physiological mechanisms underlying the independent prognostic significance of IVH are relatively well understood. Obstructive hydrocephalus and meningeal irritation from blood and its breakdown products obstruct arachnoid granulations, which are key to draining cerebrospinal fluid into dural venous sinuses, although intracranial pressure may not necessarily be increased.[138] Ependymal inflammation and fibrosis also contribute to delayed clearance of cerebrospinal fluid, which may further contribute to tissue damage caused from the primary parenchymal ICH.[75]

Smoking and Alcohol

In our study, out of 100 patients, 15 patients (15%) were alcoholics and 4 patients (4%) gave history of smoking.

In our study, alcohol had significant influence on the outcome of hemorrhagic stroke at the time of discharge from the hospital but smoking had no influence on the outcome. Both smoking and alcohol have been found to be significant risk factors for ICH[37] [51] which is deviant from our study. The lower incidence of documented smoking and alcohol could be because of unreliable history disclosure.

Use of Anticoagulants and Antiplatelets

In our study out of 100, one patient was on anticoagulant (for Atrial fibrillation) and 11 patients were on antiplatelets with 3 on dual antiplatelets and 8 on single antiplatelets.

Our study did not indicate any association between use of antiplatelets and oral anticoagulants on the outcome of hemorrhagic stroke, however, oral anticoagulants and antiplatelets have been associated with worse prognosis and are one of important risk factors for ICH especially with increased use in elderly population.[139] Antiplatelet use is associated with larger baseline hemorrhagic volumes and a higher risk of hemorrhagic growth.[140]

Hypertension

In our study out of 100 patients, 81 (81%) were known hypertensives indicating hypertension is an important risk factor in acute hemorrhagic stroke patients.

Hypertension is the most common cause of primary ICH accounting for 60-70 percent of cases with doubling of risk for ich in hypertensive patients.[141-142] In our study, presence of hypertension did not influence the outcome of hemorrhagic stroke. This was in stark contrast to previous studies which have observed worse prognosis with hypertension. In a study by Sakamoto et al (*n* = 211), a 10 mm Hg increase in uncontrolled SBP was found to be associated with poor outcomes. Outcomes assessed were early neurological deterioration (OR = 4.45, 95% CI 2.03-9.74), hematoma expansion (OR = 1.86, 95% CI 1.09-3.16), and unfavorable outcome measured by a Rankin disability scale score of 4-6 (OR = 2.03, 95% CI 1.24-3.33).[143]

Diabetes mellitus

In our study, 28 percent of patients were found to have preexisting diabetes mellitus.

Presence of diabetes mellitus was not found to have significant correlation with outcome in our study. A study by saliba et al found that

Diabetes is associated with increased risk of ICH that is directly associated with diabetes duration. ICH and HbA1c were found to have a J-shaped relationship, suggesting that both poor control as well as extreme intensive diabetes control might be associated with increased risk[144]

Chronic kidney disease (CKD)

In our study, 14% of patients were found to have underlying CKD.

Presence of CKD was not found to have significant correlation with outcome in our study, this is in contrast to previous studies in which moderate/severe CKD among patients with ICH is associated with larger, lobar hematomas and with poor outcome.[145] CKD patients require careful management because they have a higher risk of bleeding due to disturbances in the coagulation system. Among patients with ICH, previous studies showed GFR <45 mL/min/1.73 m^2 to be associated with a three-fold increase in the volume of the hematoma and a four-fold higher risk of death, compared to patients without renal impairment.[145]

Chronic Liver Disease (CLD)

Out of 100 patients, 7 patients (7%) were found to have underlying CLD.

In our study, presence of CLD had significant influence on the outcome of hemorrhagic stroke. Only a few studies have proposed that liver cirrhosis is a risk factor for ICH.[146] A population-based 9-year follow-up study demonstrated that patients with liver cirrhosis had a similar rate (1.3% versus 1.0%) of ICH development compared with the comparison cohort.[147] This was similar to study by Lagman et al who found in-hospital, and 30-day mortality rates were higher in the ESLD cohort versus the non-ESLD cohort (79 vs. 30%, 79 vs. 20%, and 64 vs. 25%, all $P \leq 0.01$).[148]

Hydrocephalus

In our study out of 100 patients, 7 had hydrocephalus and had undergone EVD insertion

In our study, presence of hydrocephalus did not influence the outcome of hemorrhagic stroke. Diringer et al observed 81 patients with ICH of whom 40 developed hydrocephalus. Compared to those without hydrocephalus, those with had significantly higher 90-day mortality rates of 51% compared to 2% (OR 1.26, 95% CI 1.13-1.42, $p < 0.0001$) [149]. Bhattathiri et al found that Favorable outcomes were more frequent (31%) when IVH was absent compared to when IVH was present (15%; p < 0.00001), with or without associated hydrocephalus. The presence of hydrocephalus lowered the likelihood of favorable outcome still further to 12% in comparison to the presence of IVH alone (20%, p ¼ 0.031).[150]

Neurosurgical intervention

In our study, 23 out of 100 patients underwent neurosurgical intervention which accounted to 23% of the group.

In our study patients undergoing neurosurgical intervention had more morbidity and mortality. In a study by Safatli patients who underwent surgical therapy had a higher survival rate compared to patients who received the conservative best medical treatment. However, this survival advantage was not statistically significant. In addition, the rate of functional disability was higher in surviving patients in the surgical therapy group, especially in the subgroup with a GCS of <11 on admission and baseline ICH volume of ≥32 ml supratentorially and >21 ml infratentorially.[135] In the STICH trial No overall benefit in functional outcome was found with early hematoma drainage, since 26% patients progressed to a favourable outcome in the surgical group vs. 24% patients in the initial conservative treatment group. Mortality rate was similar in both groups [36% surgery vs. 37% conservative].[151] In Troberg's, study 31% of all operated ICH patients were deceased after

1 year and only 24% of patients available for assessment of long-term functional outcome were independent in activities of daily life.[152]

ICH Score

ICH score was calculated at the time of presentation to the hospital comprising of 5 parameters age, GCS, volume of hematoma, location of hematoma and presence of IVH.

A highly significant positive correlation was obtained in our study between ICH score and outcome of hemorrhagic stroke at discharge, 30 and 60 days follow up. More was the ICH score, more poor was the future outcome (high morbidity (mRS = 4-5- bed bound) and mortality (mRS =6). In our study maximum patients with poor future outcome i.e. mRS score ≥4 at discharge, 30 days and 60 days follow up had ICH score ≥3. The ICH Score is a clinical grading scale composed of factors related to a basic neurological examination (GCS), a baseline patient characteristic (age), and initial neuroimaging (ICH volume, IVH, infratentorial/supratentorial origin). The purpose of this grading scale is to provide a standard assessment tool that can be easily and rapidly determined at the time of ICH presentation. Our findings were similar to those of previous studies. In a study by J. Hempill, all the 26 patients with an ICH Score of 0 survived, and all the 6 patients with an ICH Score of 5 died. Thirty-day mortality increased steadily with ICH Score ($P<0.005$).[18] A study by Ojha et al showed that ICH score on admission was significantly ($p<0.001$) positively correlated with the mRS score on discharge ($R=0.667$), 1 month ($R=0.66$) and 2 months ($R=0.765$).[3] Holay MP et al found that out of a total of 101 patients with an ICH score of >1 on admission, 33 had a poor outcome while 68 had a good outcome at the end of 30 days. Of the 45 patients with an ICH score of 0 on admission, 4 had a poor outcome while 41 had a good outcome. The on-admission ICH score was significantly associated with both, the in-hospital and 30-day functional outcome as suggested by the p-value which was <0.0001 for both. Higher the on-

admission ICH score, the poorer was the functional outcome. Similarly Jamora et al found the score to be predictive of poor functional outcome (MRS ≥4) at discharge and even more so at 30 days after discharge.[153] Cheung et al showed that cutoff values of ≥3 and ≤ 3 provided the best Youden's index of diagnostic test in all ICH Scores for mortality and good outcome, respectively, No patient with a score of 0 on the modified or new ICH Score died, and no patient with a score of 5 on any ICH Score survived. Good outcome (mRS, 0 to 2) at 30 days decreases dramatically as the ICH Score increases.[154] In a study done by Hegde in South India For ICH scores of 0, 1, 2, 3, 4, and 5 mortality rates were 7%, 16%, 33%, 62%, 95%, and 50% respectively. [122]

Thus the ICH score can be used for both risk stratification of patients for better intensive management as well as for prognostication of outcome.

SUMMARY AND CONCLUSIONS

1. The majority of the patients belonged to an age group of 51-70 years (39%) followed by 31-50 years (35%).
2. Male: Female ratio in our study was found to be 2.1:1.
3. In our study, weakness (86%) was the commonest symptom at the time of presentation to the hospital in acute hemorrhagic stroke patients, with 45 having right sided weakness and 41 having left sided. Among 45 with right sided weakness,1 patient was admitted with monoparesis, 2 with monoplegia, 15 with hemiparesis and 27 with hemiplegia. Among 41 having left sided weakness, 1 had monoparesis, 10 had hemiparesis and 30 had hemiplegia.
4. The risk factors identified in the study are increasing age, male sex, diabetes, hypertension, alcoholism, CLD, CKD and coagulopathy.
5. Mortality increased with increasing age with maximum mortality seen in age group more than 70 years (31.6%) followed by age group between 51-70 years (17.9%).
6. Females had higher risk of mortality than males each at discharge, 30 and 60 days follow up.
7. Hypertension is identified as an important risk factor with history of hypertension obtained in 81 patients in our study and 33 patients were not on regular medication.
8. GCS on admission was identified as an independent predictor of outcome.
9. The most common site of hemorrhage is gangliocapsular (38%) followed by lobar (28%) bleed.
10. CT findings such as volume of bleed (≥30cc), intraventricular extension, have a significant role in predicting the outcome in patients with ICH.
11. The Intracerebral hemorrhage score (ICH score) calculated at the time of presentation to the hospital is a simple tool that could be used for risk stratification as well as prognostication of outcome.
12. Morbidity and mortality increases steadily with ICH score.
13. Early detection of hypertension and optimal management can prevent the occurrence of hemorrhagic stroke.

LIMITATIONS OF THE STUDY

1. Small sample size of 100 patients and a single centre study as it is done within limited period of time.

2. The follow-up of 30 and 60 days is too small a period owing to the chronic nature of the disease and its recurrence.

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PROFORMA

Sr. no: Ward/Unit:

Name DOA

Age DOD

Gender MRD No:

Address

Mobile no Admn No:

Outcome of the patient: Discharge / Death / DAMA / Discharge on request

Outcome diagnosis:

Length of stay:

In Ward ------ Days

In ICU -------Days

Chief complaints at the time of admission:

CNS symptoms:

1. Disorientation
   i. To time / placed and person

   ii. Onset

   iii. Progression

   iv. Present status

Signature of Candidate **Signature of Co-Supervisor** **Signature of Supervisor**

v. Episodic or continuous

vi. Orientation between the episodes

vii. Any abnormal behaviour

viii. Recovery

2. Weakness

i. Onset

ii. Progression

iii. Present status

iv. Proximal / distal

v. Symmetrical / asymmetrical

vi. Fatigability

vii. Gaze preference

vii. Selectivity of muscles

3. Headache

i. Onset ii. Location iii. Duration

iv. Diurnal variation v. Severity vi. Timing

Signature of Candidate **Signature of Co-Supervisor** **Signature of Supervisor**

vii. Frequency (no. of episodes in a day)

viii. Preceded by aura

ix. Abnormal sweating

x. Associated with:

Nausea

Vomiting

Photophobia

Phonophobia

Abnormal behaviour

Loss of consciousness

Blurring of vision

xi. Aggravated by

xii. Relieved by

4. Seizures

i. Onset

ii. Activity at the time of incident

iii. Preceded by

headache/ giddiness/ presyncope/ visual disturbance

iv. Associated with

involuntary movement/ Tonic / clonic / focal / generalized

v. Rolling up of eyes

vi. Stare

vii. Tongue bite

viii. Urinary incontinence

ix. Stool incontinence

x. Lasted for (duration)

xi. Recovered after- spontaneous / treatment

xii. Post recovery- drowsiness/ confusion/ alert

xiii. Number of episodes

xiv. Sensorium in between episodes

xv. Last episode

xvi. Any injury sustained

5. Speech disturbance

i. Onset

ii. Comprehension

iii. Any spontaneous speech / word outflow

iv. Slurring

v. Progression

vi. Reading / writing / repetition

6. Sensory system

i. Onset

ii. Progression

iii. Present status

iv. Unable to feel clothes over the body

v. Difficulty in walking in the dark

vi. Slipping of slippers without knowledge

vii. Cotton wool sensations over the feet

viii. Band like sensation/ Encasement of limbs

ix. Pins and needles/ numbness/ tingling/ paraesthesias

x. Hot and cold water during bath

xi. Burning / shooting / pricking pain

xii. Root pain

7. Autonomic system

i. Bladder

a. Urgency / urge incontinence

b. Frequency

c. Hesitancy

d. Retention (painful/painless) and (aware / unaware)

e. Overflow incontinence/ incomplete evacuation/ dribbling of urine

f. Loss of social inhibition

g. Erectile dysfunction

ii. Stool incontinence

iii. Faintness/ palpitations

iv. Abnormal sweating/ decreased lacrimation

8. Cerebellar

i. Dizziness

ii. Vertigo

iii. Incoordination during picking up objects

iv. Occipital headache

v. Vomitings

vi. Gait ataxia

CVS Symptoms:

Abdominal symptoms:

Genitourinary symptoms:

Respiratory symptoms:

Signature of Candidate **Signature of Co-Supervisor** **Signature of Supervisor**

Similar type of attacks in the past-

Recovery-

Comorbid disease: Duration Drugs Control

1. Diabetes mellitus
2. Hypertension
3. CAD
4. Dyslipidaemia
5. Valvular heart disease
6. Prosthetic heart valve
7. CKD
8. CLD

Surgical history:

Occupational history:

Signature of Candidate **Signature of Co-Supervisor** **Signature of Supervisor**

Personal history:

- Vegetarian/Non vegetarian

- Smoker/Non smoker

  Duration: Smoking index:

- Alcoholic/Non alcoholic:
  Duration: Quantity:

- Substance abuse (cocaine / methamphetamine / other)

Family history: Hypertension/ Diabetes mellitus/ CAD/ Epilepsy/ Similar illness among other members of family

Drug history: Intake of oral contraceptives and for how long

Anticoagulants

Antiplatelets

Signature of Candidate **Signature of Co-Supervisor** **Signature of Supervisor**

General physical examination

Sensorium

Nutritional assessment- body weight height BMI

Vitals on admission

Pulse: Rate Rhythm Volume

Peripheral pulses Carotid bruit

SBP DBP MAP

Postural fall RR Temp

Pallor Icterus Cyanosis

Clubbing LAP Edema – Pitting/not

Trachea Thyroid JVP

GCS on admission

- Eye
- Verbal
- Motor

Signature of Candidate **Signature of Co-Supervisor** **Signature of Supervisor**

- **Systemic examination**

Central nervous system

1. **Higher mental function**

    a. Consciousness

    b. Oriented to time / place and person

    c. Attention / calculation

    d. Recall

    e. Language-Speech
        i. Comprehension
        ii. Naming
        iii. Reading
        iv. Writing
        v. Repetition
        vi. Any spontaneous speech / word outflow
        vi. Slurring

2. **Cranial nerves**

    I -Smell to commonly used items like soap/ shampoo/ toothpaste

    II -Visual acuity

    -RAPD

    -Fundus

    III, IV & VI
    -Position of eye at primary gaze

    -Ptosis

    -Ocular movements

    - Conjugate eye movements

    Convergence / divergence

- Ex / Enophthalmos

- Pupils

Size	Right	Left
Reaction to light- Direct Consensual		
Reaction to convergence		

- Diplopia

-Nystagmus

V -Facial sensation- touch / pain / vibration

-Muscles of mastication- clench the teeth

-Corneal reflex

-Jaw reflex

VII - Facial asymmetry

-Wrinkling of forehead

- Frowning of eyebrows / eyelid closure

- nasolabial fold

- Angle of mouth deviation

- Drooling of saliva

- Parotid swelling / Tenderness

VIII- Hearing impairment

- Giddiness

-Tinnitus

-Vertigo

IX & X

- Uvular position

- On saying “”AH”” uvula / palatal movement

- Dysphagia – solids / Liquids / Both

-Dysphonia

- Nasal Regurgitation

- Hoarseness of voice / Nasal twang

- Gag reflex

XI - Shrugging of shoulders

-Neck movements

XII- Tongue position in resting state / on protrusion

- Flaccidity / fasciculations of tongue muscles

- Movements / deviation of tongue

- Dysarthria

3. **Motor System**

a. Position / attitude of limbs

b. Bulk (wasting / hypertrophy)

c. Tone (Spasticity / flaccidity)

d. Power

i. Shoulder- Abduction-
Adduction-
Flexion -
Extension-

ii. Elbow- Flexion-
Extension-

iii. Wrist- Dorsiflexion
palmar flexion

iv. Hand grip- percentage myotonia (+/-)

v. Hip- Abduction-
Adduction-
Flexion-
Extension-

vi. Knee- Flexion-
Extension-

vii. Ankle- Dorsiflexion-
Plantar flexion-

e. Deep tendon reflexes

	Right	Left		Right	Left
Biceps			Knee		
Triceps			Ankle		
Supinator					

Reference: ++++ Clonus +++ brisk; ++ normal ; + sluggish ; - absent

f. Superficial reflexes

	Right	Left
Abdominal Upper		
Abdominal Lower		
Cremasteric		
Plantar		

4. **Sensory System:**
   a. Superficial sensations
      i. Touch
      ii. pin prick sensation

   b. Deep sensations
      i.Pain

   c. Combined
      i.Vibration
      ii. joint position

   d. Rhomberg's sign

   e. Pattern of sensory loss
      i. Symmetrical /Asymmetrical
      ii. Glove stocking / patchy
      iii. Root level

5. **Cerebellum**
    a. Intention tremor

    b. Rebound phenomenon (Holmes)

    c. Dysmetria
        i. Finger nose test
        ii. Finger nose finger
        iii. Knee shin dragging test

    d. Past pointing

    e. Nystagmus

    f. Alternating movements
        i.Pronation – supination (Dysdiadochokinesia)
        ii. Alternating opening and fisting of both hands
        iii. Opposition of thumb and fingers
        iv. Draw a circle in air with finger

    g. Hypotonia

    h. Gait

    i. Pendular knee jerk

6. **Gait and Stance**

Cardiovascular system

Respiratory system

Per Abdomen

Investigations

Parameters	At admission	At discharge
Hemogram		
TLC		
DLC		
Hb		
MCV		
MCH		
Platelet		
ESR		
LFT		
Total bilirubin		
Direct bilirubin		
SGOT		
SGPT		
ALP		
Total protein		
Serum albumin		
A:G ratio		
PTI/INR		
RFT		
Blood urea		
Serum creatinine		
Serum electrolytes Na/K/Cl		
Ca/Mg/Phos		
Uric acid		
CRP		
BNP		
Urine R/E		
Viral markers Anti HIV (Rapid/ELISA)		
Anti HCV (Rapid/ELISA)		
HbsAg (Rapid/ELISA)		
Lipid profile [Panel] Cholesterol (T)		
Triglycerides		
Cholesterol (HDL)		
Cholesterol (LDL)		

Signature of Candidate **Signature of Co-Supervisor** **Signature of Supervisor**

ICH score at presentation

a. Age >= 80 years: yes (Score=1) no (Score= 0).

b. Glasgow coma scale (GCS) at presentation:

GCS score 3 to 4	(2 points)
GCS score 5 to 12	(1 point)
GCS score 13 to 15	(0 point)

c. Volume of hematoma on baseline CT scan of brain by ABC/2 formula:

A B C

ICH volume

ICH volume >= 30 cm3	(1 point)
ICH volume < 30 cm3	(0 point)

d. Location of hematoma (infratentorial or supratentorial):

Infratentorial origin yes (Score=1) no (Score=0).

e. Presence of intraventricular extension: yes (Score=1) no (Score= 0)

Total Score:

Signature of Candidate **Signature of Co-Supervisor** **Signature of Supervisor**

Radiological Investigations

- NCCT head

- MRI Brain

Other investigations

- 2 D ECHO

Outside reports

Any other investigations(s)

Surgical intervention

Morbidity outcome at discharge:

(Using mRS)

No symptoms	Score=0
No significant disability. Able to carry out all usual activities, despite some symptoms.	Score= 1
Slight disability. Able to look after own affairs without assistance, but unable to carry out all previous activities.	Score=2
Moderate disability. Requires some help, but able to walk unassisted.	Score = 3
Moderately severe disability. Unable to attend to own bodily needs without assistance, and unable to walk unassisted.	Score=4
Severe disability. Requires constant nursing care and attention, bedridden, incontinent.	Score =5
Dead	Score=6

Signature of Candidate **Signature of Co-Supervisor** **Signature of Supervisor**

FOLLOW UP	**At 30 days**	**At 60 days**
Date-		
Modified Rankin Scale (mRS)		

Signature of Candidate **Signature of Co-Supervisor** **Signature of Supervisor**

Sr. No	MRD No	Name	Age	Gender	Admn No	Outcome of the patient	Site of bleed (gangliocapsular-1, Thalamic - 2 , cerebellum - 3, Pontine/brainstem - 4 , cortical/atypical - 5)	Side of bleed			IVH yes/NO	Hydrocephalus	coagulopathy	Outcome diagnosis	Length of stay (In Days)		CNS Symptoms								
																	ALTERED SENSORIUM	WEAKNESS							
																		MONOPARESİS		MONOPLEGIA		HEMIPARESIS		HEMIPLEGIA	
								RIGHT	LEFT	B/l					In Ward	In ICU		RT	LT	RT	LT	RT	LT	RT	LT
1	876737	SS	47	Male	2020001091	Discharged	1		yes		yes			HTN with Acute left gangliocapsular bleed with IVH .	5	0	NO					yes			
2	893510	BM	85	Male	2020008697	Discharged	1		yes		yes			HTN with left gangliocapsular bleed with mass effect with left UMN facial nerve palsy	7	3	drowsy few hrs pta							yes	
3	897834	JK	65	Female	2020010522	Discharged	5		yes					Type ii dm with htn with acute cva with Lt frontal lobe ICH (amyloid angiopathy) with left UMN Facial Nerve palsy with Acute Dementia	6	1	Confused state with increased forgetfullness					yes			
4	922357	VK	74	Male	2020022796	Discharged	1		yes					acute cva- Posterior limb of left internal capsule bleed	6		NO					yes			
5	930892	SK	53	Male	2020028715	Discharged	1		yes					HTN with left gangliocapsular bleed with left umn facial nerve palsy	7	2	Drowsy					yes			
6	941370	MK	75	Female	2020034147	Discharged	1 and 2	yes			yes			right thalmocapsular bleed with mass effect with ivh	17	4	Drowsy								yes
7	943000	MK	52	Female	2020034895	Dama	1	yes			yes			Rt Basal Ganglia Bleed with IVH with Mid line shift of 7 mm with diffuse cerebral and cerebral edema	0	1	unconscious								
8	973596	BS	43	Male	2020047956	Discharged	1	yes			yes			Type ii Dm with Htn with acc htn with acute cva- left hemiplegia with right gangliocapsular bleed with ivh with mass effect with mls of 3mm towards left	5		drowsy								yes
9	519111	GS	48	Male	2020049534	Discharged	5		yes					neurosarcoidosis with left temporoparietal ich ? Vasculitis	8		no					yes			
10	986392	J	18	Female	2020054387	Dama	5		yes					left frontal ich- secondary to av malformation		1	drowsy					yes			
11	987294	TS	66	Male	2020054783	Discharged	5		yes					HTN with BA with left parietal ich with ? Amyloid angiopathy	6		drowsy					yes			
12	831981	HS	85	Male	2020057523	Discharged	5		yes		yes			type ii dm with htn with acute cva- left tomporo occipital region bleed with mass effect with ivh with seizure disorder with old right hemiparesis (2007)	12	8	drowsy few hrs pta							yes	
13	905192	JR	75	male	2020013750	Discharged	1	yes			yes			htn with ich- right gangliocapsular bleed with left hemiparesis with post op c/o right ftp decompression craniotomy under ga on 25/02/2020	8	5	yes restless						yes		
14	914081	J	17	Female	2020017582	Discharged	5	yes			yes			right parieto-temporal ich with ivh with mass effect with mls of 7mm towards left with av malformation- post right ftp flap craniotomy with evacutaion of ich with excision of avm with lax duraplasty under ga on 11.03.2020	7	5	restless/agitated						yes		
15	911755	JS	45	Male	2020016500	Dor	1 and 2	yes			yes			htn with acute right thalamo-capsular bleed with ivh with mass effect with mls of 4mm towards left	8		NO						yes		
16	912364	JS	24	Male	2020016760	Discharged	1		yes		yes			acute ich- left gangliocapsular bleed with mass effect- post left ftp decompression craniectomy with evacualtion of ich on 08/03/2020	10	4	sudden onset LOC 2-3 hrs pta							yes	
17	904282	GP	60	Male	2020013363	Discharged	1	yes			yes			Type ii dm with htn with cad post cabg with right gangliocapsular bleed	9	5	drowsy few hrs pta								yes
18	914003	JP	40	Male	2020017531	Discharged	1 and 2	yes			yes			htn with htn nephrosclerosis with right thalmocapsular bleed with ivh	9		NO						yes		
19	910086	SS	62	Male	2020015787	Discharged	5	yes						htn with right occipital ich- p/o/c/o right ftp craniotomy with evacuation of ich under ga on 10.03.2020	7	6	NO						yes		
20	908689	S	25	Male	2020020958	Discharged	5	yes			yes			right parieto-temporal ich with ivh with av malformation - post right ftpo flap craniotomy with evacutaion of ich with insertion of right evd with excision of avm under ga on 27.03.2020	7	9	drowsy								yes
21	920276	TR	72	Female	2020020707	Discharged	3	yes						htn with acc htn with post fossa bleed (right cerebellar hemispheres and vermis)	11		NO								
22	920898	MA	17	Male	2020021339	Dama	1	yes			yes			htn with acc htn with ckd with acute cva- left complete hemiplegia- right gangliocapsular bleed with mass effect		3	drowsy								yes

					Comorbid disease								Personal history			DRUG HISTORY			General physical examination						
WEAKNESS	HEADACHE	VOMITING	SEIZURE	SPEECH DISTURBANCE	Diabetes mellitus	Dm	HTN	HTN	CAD	CAD	CKD	CLD	Vegetarian/Non veg	Smoker/Non smoker	Alcoholic/Non alcoholic	Anticoagulants	Antiplatelets	Antiplatelets	Sensorium	Vitals on admission					
																				Pulse	SBP	DBP	MAP	RR	Temp
Rt sided hemiparesis since 1 day pta	yes	yes	NO	no	NO	no	yes	yes since 10 yrs	no	NO	NO	NO	veg	no	no	no	no	no	conscious well oriented	92	150	100	117	24	98.6
Rt sided hemiplegia since morning	yes	yes	No	broca's aphasia	NO	no	yes	yes since 20 yrs	no	NO	NO	NO	veg	no	no	no	yes on single antiplatelet	yes on ecosprin 75mg	drowsy but arousable	86	140	90	107	18	96.6
Rt sided hemiparesis since 1 day pta	No	no	NO	yes	yes since 15 yrs	yes	yes	yes since 15 yrs	no	NO	NO	NO	veg	no	no	no	no	no	drowsy but arousable	78	120	70	87	24	98.4
Rt sided hemiparesis since 1 day pta	No	yes	NO	no	NO	no	no	no	no	NO	NO	NO	non veg	yes	yes	no	no	no	conscious well oriented	88	130	80	97	20	98.6
right sided hemiparesis	No	yes	NO	yes	NO	no	yes	yes since 10 yrs	no	NO	NO	NO	non veg	no	no	no	no	no	drowsy but arousable	86	160	100	120	20	98.6
left sided hemipegia	yes	no	NO	no	NO	no	yes	yes since 20 yrs	no	NO	NO	NO	non veg	no	no	no	no	no	drowsy but arousable	96	150	90	110	22	98.4
No	yes	yes	NO	no	yes	yes	yes	no	yes	cad post cabg in 1994	NO	NO	veg	no	no	on acitrom	yes on single antiplatelet	yes on ecosprin 75mg	unconscious	150	90	50	63	24	98.6
left sided hemiplegia since 1 day pta	No	no	NO	no	yes since 8 yrs	yes	yes	yes since 3 yrs	no	NO	NO	NO	non veg	no	yes	no	no	no	drowsy but arousable	88	170	100	123	22	98.4
right sided hemiparesis since 17 days	No	no	NO	no	NO	no	no	no	no	NO	NO	NO	non veg	no	no	no	no	no	conscious well oriented	84	120	80	93	18	98.4
right sided hemiparesis since few hrs pta	yes	yes	NO	no	NO	no	no	no	no	NO	NO	NO	veg	no	no	no	no	no	drowsy but arousable	106	100	60	73	24	100
sudden onset right sided hemiparesis since 1 day pta	No	no	NO	no	NO	no	no	no	no	NO	NO	NO	non veg	no	no	no	no	no	drowsy but arousable	114	160	100	120	24	98.4
sudden onset right sided hemiplegia since few hrs pta	yes	yes	yes(gtcs)	no	yes since 25 yrs	yes	yes	yes since 15 yrs	no	NO	NO	NO	veg	no	no	no	no	no	drowsy but arousable	60	140	80	100	20	98.4
sudden onset left sided hemiparesis 2hr pta	No	no	NO	no	NO	no	yes (on ir	yes (on irregular t/t)	no	NO	NO	NO	non veg	no	no	no	no	no	drowsy but arousable	86	170	100	123	18	98.4
left sided hemiparesis since 1 day pta	yes	yes	NO	no	NO	no	no	no	no	NO	NO	NO	veg	no	no	no	no	no	drowsy but arousable	60	100	70	80	22	98.4
sudden onset left sided hemiparesis 1 day pta	yes	yes	NO	no	NO	no	yes (on ir	yes (on irregular t/t)	no	NO	NO	NO	non veg	no	no	no	no	no	conscious well oriented	98	160	90	113	20	98.4
sudden onset right sided hemiplegia 6-7 hrs pta	No	no	NO	broca's aphasia	NO	no	yes (on ir	yes (on irregular t/t)	no	NO	NO	NO	non veg	no	no	no	no	no	drowsy but arousable	116	220	100	140	22	98.4
sudden onset left sided hemiplegia since 1 day	yes	no	NO	no	yes since 5 yrs	yes	yes	yes since 15 yrs	yes	cad post cabg in 2015	NO	NO	non veg	no	no	no	yes on dual antiplatelets	yes on ecosprin gold	drowsy but arousable	82	180	90	120	24	98.4
sudden onset left sided hemiparesis since 1 day	No	no	NO	no	NO	no	yes (on ir	yes (on irregular t/t)	no	NO	yes	NO	veg	no	no	no	no	no	conscious well oriented	100	220	140	166	24	98.4
No	yes	yes	NO	no	NO	no	yes	yes since 8-10 yrs	no	NO	NO	NO	non veg	no	no	no	no	no	conscious well oriented	120	120	80	93	24	98.4
sudden onset left sided hemiplegia since 2hrs pta	yes	yes	NO	no	NO	no	no	no	no	NO	NO	NO	veg	no	no	no	no	no	drowsy but arousable	188	160	90	113	24	98.4
No	yes	yes	NO	no	NO	no	yes (on ir	yes (on irregular t/t)	no	NO	NO	NO	veg	no	no	no	no	no	conscious well oriented	86	210	100	137	18	98.4
sudden onset left sided hemiplegia (both upper and lower limb) x 1 day pta	No	no	NO	no	NO	no	yes (on ir	yes (on irregular t/t)	no	NO	yes	NO	non veg	no	no	no	no	no	drowsy but arousable	92	210	120	150	18	98.4

						GCS on admission				Systemic CNS examination																	
										1. Higher mental function	2. Cranial nerves	3. Pupil												Deep tendon reflexes			
												Size		Reaction to light		Reaction to convergence		Tone (flacidity/ spasticity)		Power upper limb		Power lower limb		biceps		triceps	
Pallor	Icterus	Cyanosis	Clubbing	LAP	Edema – Pitting/not	gcs score	Eye	Verbal	Motor			Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left
NO	NO	NO	NO	NO	NO	15	4	5	6	normal	normal	2.5 mm	2.5 mm	Reactive	Reactive	Reactive	Reactive	flaccid UL & LL	normal	2-5	5-5	3-5	5-5	Absent	Normal	Absent	Normal
NO	NO	NO	NO	NO	NO	10	3	1	6	drowsy	normal	2.8 mm	2.8 mm	Reactive	Reactive	Reactive	Reactive	flaccid UL & LL	normal	0/5	5-5	0/5	5-5	Absent	Normal	Absent	Normal
NO	NO	NO	NO	NO	NO	13	4	3	6	drowsy	rt umn facial nerve palsy	2.6 mm	2.6 mm	Reactive	Reactive	Reactive	Reactive	spastic UL & LL	normal	3-5	5-5	0/5	5-5	exagerrated	Normal	exagerrated	Normal
NO	NO	NO	NO	NO	NO	15	4	5	6	normal	normal	2.5mm	2.5mm	reactive	reactive	reactive	reactive	spastic UL & LL	normal	2-5	5-5	3-5	5-5	exagerrated	Normal	exagerrated	Normal
NO	NO	NO	NO	NO	NO	13	4	3	6	drowsy	rt umn facial nerve palsy	2.5 mm	2.5 mm	Reactive	Reactive	Reactive	Reactive	flaccid UL & LL	normal	3-5	5-5	4-5	5-5	Absent	Normal	Absent	Normal
NO	NO	NO	NO	NO	NO	11	3	3	5	drowsy	normal	2.6 mm	2.6 mm	Reactive	Reactive	Reactive	Reactive	normal	flaccid UL & LL	5-5	0/5	5-5	0/5	Normal	Absent	Normal	Absent
NO	NO	NO	NO	NO	NO	3	1	t	1	Unconscious	normal	4.2 mm	4.4 mm	Non-Reactive	Non-Reactive	Non-Reactive	Non-Reactive	flaccid UL & LL	flaccid UL & LL	0/5	0/5	0/5	0/5	Absent	Absent	Absent	Absent
NO	NO	NO	NO	NO	NO	11	3	3	5	drowsy	normal	2.5mm	2.5mm	reactive	reactive	reactive	reactive	normal	flaccid UL & LL	5-5	0/5	5-5	0/5	normal	Absent	normal	absent
NO	NO	NO	NO	NO	NO	15	4	5	6	normal	normal	2.5mm	2.5mm	reactive	Reactive	reactive	Reactive	normal	normal	4-5	5-5	4-5	5-5	normal	normal	normal	normal
NO	NO	NO	NO	NO	NO	13	4	4	5	drowsy	normal	2.5mm	2.5mm	reactive	Reactive	reactive	Reactive	spastic UL & LL	normal	2-5	4-5	0/5	4-5	exagerrated	Normal	exagerrated	Normal
NO	NO	NO	NO	NO	NO	13	4	4	5	drowsy	normal	2.5mm	2.5mm	reactive	Reactive	reactive	Reactive	flaccid UL & LL	normal	3-5	5-5	3-5	5-5	Absent	Normal	Absent	Normal
NO	NO	NO	NO	NO	NO	11	3	3 then t	5	drowsy	normal	2.5mm	2.5mm	reactive	Reactive	reactive	Reactive	flaccid UL & LL	normal	0/5	4-5	0/5	4-5	Absent	Normal	Absent	Normal
NO	NO	NO	NO	NO	NO	9	3	1 then t	5	drowsy	normal	2.5mm	2.5mm	reactive	Reactive	reactive	Reactive	normal	flaccid UL & LL	4-5	0/5	4-5	2-5	Normal	Absent	Normal	Absent
NO	NO	NO	NO	NO	NO	11	3	3	5	drowsy	normal	2.5mm	2.5mm	reactive	Reactive	reactive	Reactive	normal	spastic UL & LL	4-5	2-5	4-5	3-5	Normal	Exaggerated	Normal	Exaggerated
NO	NO	NO	NO	NO	NO	15	4	5	6	normal	normal	2.5mm	2.5mm	reactive	Reactive	reactive	Reactive	normal	spastic UL & LL	5-5	0/5	5-5	2-5	Normal	exagerrated	Normal	Exaggerated
NO	NO	NO	NO	NO	NO	10	4	1	5	drowsy	normal	2.5mm	2.5mm	reactive	Reactive	reactive	Reactive	flaccid UL & LL	normal	0/5	5-5	0/5	5-5	Absent	Normal	Absent	Normal
NO	NO	NO	NO	NO	NO	11	4	1	6	drowsy	normal	2.5mm	2.5mm	reactive	Reactive	reactive	Reactive	normal	flaccid UL & LL	5-5	0/5	5-5	0/5	Normal	Absent	Normal	Absent
NO	NO	NO	NO	NO	NO	15	4	5	6	normal	normal	2.5mm	2.5mm	reactive	Reactive	reactive	Reactive	normal	flaccid UL & spastic LL	5-5	0/5	5-5	3-5	Normal	Absent	Normal	Absent
NO	NO	NO	NO	NO	NO	15	4	5	6	normal	normal	2.5mm	2.5mm	reactive	Reactive	reactive	Reactive	normal	normal	5-5	4-5	5-5	4-5	Normal	Normal	Normal	Normal
NO	NO	NO	NO	NO	NO	9	3	t	5	drowsy	normal	2.5mm	2.5mm	reactive	Reactive	reactive	Reactive	normal	flaccid UL & LL	(moving r>	0/5	4-5	0/5	Normal	Absent	Normal	Absent
NO	NO	NO	NO	NO	NO	15	4	5	6	normal	normal	2.5mm	2.5mm	reactive	Reactive	reactive	Reactive	normal	normal	5-5	5-5	5-5	5-5	Normal	Normal	Normal	Normal
yes	NO	NO	NO	NO	NO	12	3	4	5	drowsy	normal	3.5mm	3mm	Non-Reactive	sluggishly reacting	Non-Reactive	sluggishly reacting	normal	flaccid UL & LL	(moving R>	0/5	4-5	0/5	Normal	Absent	Normal	Absent

																INVESTIGATIONS											
														5. sensory system	6. cerebellar signs	HEMOGRAM										LFT	
						superficial reflexes																					
suppinator		knee		ankle		upper abdominal		lower abdominal		cremasteric		Plantar				TLC		HB		MCV		MCH		PLATELET		TOTAL BILIRUBIN	
Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left			At admission	At discharge	At admission	At discharge	At admission	At discharge	At admission	At discharge	At admission	At discharge	At admission	At discharge
Absent	Normal	Absent	Normal	Absent	Normal	Normal	Normal	Normal	Normal	Normal	Normal	extensor	flexor	Normal	normal	11.2	8.4	14.1	12.8	87	85	29	28	170	240	0.42	0.34
Absent	Normal	Absent	Normal	Absent	Normal	Normal	Normal	Normal	Normal	Normal	Normal	extensor	flexor	Normal	normal	8.6	9.4	12.7	11.1	82.9	84.8	27.4	27.5	100	191	0.24	na
exagerrated	Normal	exagerrated	Normal	exagerrated	Normal	Absent	Normal	Absent	Normal	Absent	Normal	extensor	flexor	Normal	normal	16.6	8.2	11.8	11.5	86.8	86.1	28.5	28.2	162	208	0.48	na
exagerrated	Normal	exagerrated	Normal	exagerrated	Normal	Absent	Normal	Absent	Normal	Absent	Normal	extensor	flexor	Normal	normal	12	6.7	13.5	12.9	101.4	101.5	33.5	33.5	253	212	0.43	na
Absent	Normal	Absent	Normal	Absent	Normal	Normal	Normal	Normal	Normal	Normal	Normal	extensor	flexor	Normal	normal	13.1	8.4	14.5	13.7	97.9	97.2	33.3	33.8	175	225	0.87	na
Normal	Absent	Normal	Absent	Normal	Absent	Normal	Normal	Normal	Normal	Normal	Normal	flexor	extensor	Normal	normal	8.3	9.6	11.4	10.9	94.5	94.2	31.5	31.2	150	198	0.51	na
Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	extensor	extensor	Can't be assesed	Can't be assesed	13.7	na	10.3	na	84.7	na	26.2	na	150	na	0.42	na
normal	absent	normal	absent	normal	absent	Normal	normal	normal	normal	normal	normal	flexor	extensor	Normal	normal	6.8	7.6	15.7	13.9	92.8	92.6	31.9	31.5	204	252	0.65	na
normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	extensor	flexor	Normal	normal	8.7	9.8	13.2	12.4	82.9	82.3	26.8	26.2	237	210	na	na
exagerrated	Normal	exagerrated	Normal	exagerrated	Normal	Absent	Normal	Absent	Normal	Absent	Normal	extensor	flexor	Normal	normal	16.1	na	12.4	na	86.4	na	27.7	na	172	na	0.46	na
Absent	Normal	Absent	Normal	Absent	Normal	Normal	Normal	Normal	Normal	Normal	Normal	extensor	flexor	Normal	normal	16.2	8.4	13.6	12.2	89.9	89.5	28.5	28.4	168	160	0.57	na
Absent	Normal	Absent	Normal	Absent	Normal	Normal	Normal	Normal	Normal	Normal	Normal	extensor	flexor	Normal	normal	16.2	9.8	13.7	12.8	88.8	88.2	29.3	29.1	260	375	0.78	0.52
Normal	Absent	Normal	Absent	Normal	Absent	Normal	Normal	Normal	Normal	Normal	Normal	flexor	extensor	Normal	normal	10.7	8.8	10.1	9	89.3	89.2	28.5	28.6	215	197	0.34	na
Normal	Exaggerated	Normal	Exaggerated	Normal	Exaggerated	Normal	Absent	Normal	Absent	Normal	Absent	flexor	extensor	Can't be assesed	Can't be assesed	21.1	12.2	13.5	12.8	81.4	83.4	26.1	27.4	283	351	0.42	na
Normal	Exaggerated	Normal	Exaggerated	Normal	Exaggerated	Normal	Absent	Normal	Absent	Normal	Absent	flexor	extensor	Tingling and numbness along left UL &	normal	12.9	8.6	18	13.3	90.8	89.6	30.6	30.2	195	180	0.9	na
Absent	Normal	Absent	Normal	Absent	Normal	Normal	Normal	Normal	Normal	Normal	Normal	extensor	flexor	Normal	normal	16.7	9.8	15.3	13.8	86.5	86.4	27.7	27.2	278	296	1.29	0.86
Normal	Absent	Normal	Absent	Normal	Absent	Normal	Normal	Normal	Normal	Normal	Normal	flexor	extensor	Normal	normal	7.8	8.2	13.8	12.5	89.4	89.1	28.7	28.3	130	286	0.38	na
Normal	Absent	Normal	Exaggerated	Normal	Exaggerated	Normal	Normal	Normal	Normal	Normal	Normal	flexor	extensor	Normal	normal	11.6	11.4	14.2	13.9	80.4	80	26.1	26.5	209	327	0.52	na
Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	flexor	flexor	Normal	normal	14.1	10.8	14.9	12.6	97.1	96.6	32.4	32.1	174	256	1.25	0.8
Normal	Absent	Normal	Absent	Normal	Absent	Normal	Normal	Normal	Normal	Normal	Normal	flexor	extensor	Normal	normal	18.2	11.3	10.9	10.5	72.4	76.2	22	24	263	223	0.52	na
Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	flexor	flexor	Normal	present	18.4	8.5	11.7	10.5	89	88.8	28.3	28.2	219	263	0.44	na
Normal	Absent	Normal	Absent	Normal	Absent	Normal	Normal	Normal	Normal	Normal	Normal	flexor	extensor	Normal	normal	16.5	12.2	10.3	10.2	70.7	70.5	20.9	20.8	226	210	0.59	na

												RFT						Lipid profile							
DIRECT BILIRUBIN		SGOT/SGPT		ALP		TOTAL PROTEIN		SERUM ALBUMIN		PTI/ INR		BLOOD UREA		SERUM CREATININE		Serum electrolytes(		CHOLESTEROL(T)		Triglycerides		cholesterol (HDL)		cholesterol (LDL)	
At admission	At discharge	At admission	At discharge	At admission	At discharge	At admission	At discharge	At admission	At discharge	At admission	At discharge	At admission	At discharge	At admission	At discharge	At admission	At discharge	At admission	At discharge	At admission	At discharge	At admission	At discharge	At admission	At discharge
0.18	0.1	19/36	18/36	70	74	7.5	6.6	4.61	3.2	1.04	1.2	33	29	0.83	0.56	142/3.16/99	136/4.2/99	na	na	na	na	na	na	na	na
0.07	na	45/60	32/38	181	na	7.7	na	4.02	na	0.99	na	39	28	1.16	0.76	143/4.40/105	139/4.12/102	na	na	na	na	na	na	na	na
0.24	na	47/48	24/38	100	na	7.5	na	3.89	na	1.09	na	28	22	0.89	0.71	139/3.56/100	138/4.56/99	na	na	na	na	na	na	na	na
0.06	na	24/15	na	63	na	6.5	na	4.07	na	1.07	na	32	28	0.83	0.66	140/4.07/105	139/3.9/101	204	na	172	na	44	na	134	na
0.26	na	33/31	na	94	na	7.4	na	4.41	na	1.1	na	40	28	0.96	0.71	136/3.94/96	138/4.27/98	na	na	na	na	na	na	na	na
0.18	na	24/18	26/38	92	na	7.5	na	4.12	na	1.1	na	35	28	0.92	0.68	138/3.56/103	139/4.25/100	na	na	na	na	na	na	na	na
0.07	na	32/26	na	88	na	6.4	na	3.92	na	7.27	na	20	na	0.71	na	142/4/111	na	na	na	na	na	na	na	na	na
0.43	na	39/35	na	100	na	7.7	na	4.9	na	1.04	na	13	29	1.02	0.84	139/3.90/95	138/4.2/99	na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na	na	na	1.02	na	26	25	0.85	0.84	137/3.96/101	138/4.2/99	na	na	na	na	na	na	na	na
0.1	na	26/15	na	109	na	6.8	na	4.22	na	1.14	na	19	na	0.46	na	140/3.53/107	na	na	na	na	na	na	na	na	na
0.26	na	20/16	na	79	na	6.9	na	4.54	na	1.28	na	32	na	0.9	na	136/3.93/97	138/4.32/101	na	na	na	na	na	na	na	na
0.16	0.15	34/35	28/32	127	105	7.6	5.9	4.56	3.12	1.06	1.19	28	33	1.08	0.56	128/4.35/91	140/4.02/101	na	na	na	na	na	na	na	na
0.12	na	26/29	35/38	96	na	7.2	na	4.12	na	1.24	1.16	29	30	0.77	0.89	133/3.09/99	138/4.02/104	na	na	na	na	na	na	na	na
0.16	na	24/14	na	133	na	7.7	na	4.72	na	1.21	na	25	27	0.74	0.63	140/3.77/97	138/3.87/101	na	na	na	na	na	na	na	na
0.38	na	29/73	na	113	na	6.4	na	3.83	na	1.06	na	35	26	0.68	0.55	136/3.25/98	133/3.99/100	na	na	na	na	na	na	na	na
0.29	0.18	30/41	26/24	128	107	8.3	6.9	4.66	3.8	0.97	na	35	28	1.7	0.7	140/4.02/101	138/4.2/100	na	na	na	na	na	na	na	na
0.12	na	25/23	na	101	na	6.8	na	3.99	na	1.07	na	36	32	0.78	0.69	139/4.82/105	136/4.32/99	na	na	na	na	na	na	na	na
0.18	na	34/38	na	106	na	7.2	na	4.02	na	1.13	na	45	57	2.69	1.88	139/3.81/96	138/3.96/101	na	na	na	na	na	na	na	na
0.42	0.26	27/31	25/38	86	92	8.3	7.5	4.61	3.99	1.03	na	20	32	0.83	0.82	139/4.13/92	136/3.99/100	185	na	177	na	77	na	102	na
0.1	na	32/59	28/26	142	na	7.6	na	4.16	na	1.21	na	19	18	0.9	0.99	138/4.73/99	139/4.35/101	na	na	na	na	na	na	na	na
0.08	na	40/16	na	109	na	7.7	na	4.56	na	1.04	na	35	24	0.68	0.64	141/4.56/99	139/4.2/100	na	na	na	na	na	na	na	na
0.19	na	40/24	na	132	na	8.4	na	4.84	na	1.2	na	41	58	1.44	1.94	143/4.26/101	146/3.77/105	na	na	na	na	na	na	na	na

ICH score at presentation							CT angio with venous cuts	MRI angio with venous cuts	2D ECHO	surgery	Surgical intervention	Morbidity outcome at discharge Using Modified Rankin Scale (mRS)	FOLLOW UP	
Age >= 80 years	Glasgow coma scale (GCS) at presentation	Volume of hematoma on baseline CT scan of brain by ABC/2 formula		Location of hematoma (infratentorial or supratentorial)	Presence of intraventricular extension	Total Score							At 30 days using Modified Rankin Scale (mRS)	At 60 days using Modified Rankin Scale (mRS)
			ICH volume	Infratentorial origin										
no (score 0)	gcs: 15 (score 0)	0	2.5 cm3 (score 0)	no (score 0)	yes (score 1)	1	normal	not done	conc lvh with ef 52%	no	no	score 4	score 3	score 2
yes (score 1)	gcs: 10 (score 1)	0	20.7 cm3 (score 0)	no (score 0)	yes (score 1)	3	not done	not done	na	no	no	score 4	score 4	score 4
no (score 0)	gcs: 13 (score 0)	0	3.24 cm3 (score 0)	no (score 0)	no (score 0)	0	normal	not done	na	no	no	score 4	score 4	score 3
no (score 0)	gcs: 15 (score 0)	0	0.36 cm3 (score 0)	no (score 0)	no (score 0)	0	not done	not done	na	no	no	score 4	score 3	score 2
no (score 0)	gcs: 13 (score 0)	0	16.25 cm3 (score 0)	no (score 0)	no (score 0)	0	not done	not done	na	no	no	score 4	score 4	score 3
no (score 0)	gcs: 11 (score 1)	0	4.4 cm3 (score 0)	no (score 0)	yes (score 1)	2	not done	not done	na	no	no	score 4	score 4	score 4
no (score 0)	gcs: 3 (score 2)	1	34.48 cm3 (score 1)	no (score 0)	yes (score 1)	4	not done	not done	na	no	no	dcore 5	score 6	
no (score 0)	gcs: 11 (score 1)	1	51.06cm3 (score 1)	no (score 0)	yes (score 1)	3	not done	not done	na	no	no	score 4	score 4	score 4
no (score 0)	gcs: 15 (score 0)	0	score 0	no (score 0)	no (score 0)	0	normal	normal	normal lv function with ef 60%	no	no	score 3	score 2	score 1
no (score 0)	gcs: 13 (score 0)	0	14.9 cm3 (score 0)	no (score 0)	yes (score 1)	1	av malformatio	not done	na	no	surgery advised but refused	score 5	not able to follow	
no (score 0)	gcs: 13 (score 0)	0	score 0	no (score 0)	no (score 0)	0	normal	not done	conc lvh with ef 60%	no	no	score 4	score 4	score 3
yes (score 1)	gcs: 11 (score 1)	1	score 1	yes (score 1)	yes (score 1)	5	not done	not done	na	no	no	score 5	score 5	score 4
no (score 0)	gcs: 9 (score 1)	1	score 1	no (score 0)	yes (score 1)	3	not done	not done	conc lvh with ef 60%	yes	yes	score 5	score 5	score 5
no (score 0)	gcs: 11 (score 1)	0	score 0	no (score 0)	yes (score 1)	2	av malformatio	not done	na	yes	yes	e4v5m6, score 3	score 2	score 1
no (score 0)	gcs: 15 (score 0)	0	9.568 cm3 (score 0)	no (score 0)	yes (score 1)	1	not done	not done	na	no	no	score 4	score 4	score 4
no (score 0)	gcs: 10 (score 1)	1	34.78 cm3 (score 1)	no (score 0)	yes (score 1)	3	not done	not done	conc lvh with ef 60%	yes	yes	score 4	score 4	score 4
no (score 0)	gcs: 11 (score 1)	1	score 1	no (score 0)	yes (score 1)	3	not done	not done	CAD (RWMA) with ef 36% with type I dd	no	no	score 4	score 4	score 4
no (score 0)	gcs: 15 (score 0)	0	4.104 cm3 (score 0)	no (score 0)	yes (score 1)	1	not done	not done	na	no	no	score 4	score 4	score 3
no (score 0)	gcs: 15 (score 0)	0	3.857 cm3 (score 0)	yes (score 1)	no (score 0)	1	not done	not done	normal lv function with ef 60%	yes	yes	score 3	score 3	score 2
no (score 0)	gcs: 9 (score 1)	1	score 1	no (score 0)	yes (score 1)	3	av malformatio	not done	na	yes	yes	e4v5m6, score 4	score 4	score 4
no (score 0)	gcs: 15 (score 0)	0	16.38 cm3 (score 0)	yes (score 1)	no (score 0)	1	not done	not done	na	no	no	score 3	score 3	score 2
no (score 0)	gcs: 12 (score 1)	0	13.056 (score 0)	no (score 0)	yes (score 1)	2	not done	not done	na	no	surgery advised but refused	score 5	score 4	score 4

Sr. No	MRD No	Name	Age	Gender	Admn No	Outcome of the patient	Site of bleed (gangliocapsular-1, Thalamic - 2 , cerebellum - 3, Pontine/brainstem - 4 , cortical/atypical - 5)	Side of bleed			IVH yes/NO	Hydrocephalus	coagulopathy	Outcome diagnosis	Length of stay (In Days)		CNS Symptoms								
																	ALTERED SENSORIUM	WEAKNESS							
																		MONOPARESİS		MONOPLEGIA		HEMIPARESIS		HEMIPLEGIA	
								RIGHT	LEFT	B/l					In Ward	In ICU		RT	LT	RT	LT	RT	LT	RT	LT
23	920973	DK	55	Female	2020021423	Dor	1	yes			yes			right gc bleed with mass effect	14	10	drowsy (sudden onset loc few hrs pta)								yes
24	921708	KK	50	Female	2020022201	Discharged	1	yes						htn with acute cva- left complete hemiplegia with right gangliocapsular bleed with right umn facial nerve palsy	4		drowsy but arrousable								yes
25	922365	RK	88	Female	2020022803	Discharged	1	yes						type ii dm with htn with acute cva- left complete hemiplegia with right gc bleed with right umn facial nerve palsy	4		drowsy but arrousable								yes
26	922645	KS	46	Male	2020023037	dor	4	yes			yes			htn with acute cva- right pontine ich- intubated on 16/04/2020	3	8	drowsy (sudden onset loc 10hrs pta)								yes
27	922985	HD	80	Male	2020023335	Death	1		yes		yes			type ii dm with htn with right complete hemiplegia with left gc bleed with multiple liver sol's- hcc (afp:130)		4	yes since 2days							yes	
28	645794	S	59	Female	2020023936	Dama	4	yes			yes			type ii dm with htn with ckd5d with post cbd stenting and cholecystectomy with f/u/c/o dah with brainstem bleed (mid line and pons) with ivh		1	yes (post hd)								yes
29	924016	SK	58	Female	2020024245	Discharged	3		yes		yes			htn with acute cva- left cerebellar bleed with ivh	5		NO						yes		
30	924175	VK	71	Male	2020024403	Discharged	5		yes					htn with right complete hemiplegia- left parietal ich with mid line shift with prostatomegaly	19	13	drowsy- sudden loc 5 days pta							yes	
31	921318	MKA	39	Male	2020040445	Discharged	3	yes						htn with acc htn with ckd (htn nephrosclerosis) with right cerebellar bleed	8		NO					yes			
32	917503	RK	48	Male	2020019204	Death	1 and 2	yes			yes	present	present	right thalmocapsular bleed with mass effect with hydrocephalus with ivh with cirrhosis with portal htn with moderate ascites with coagulopathy with post right evd insertion (on 17.03.2020) with post tracheostomy		24	unconscious since 1 day pta								
33	926205	PK	70	Female	2020025909	Dama	1	yes			yes			htn with ckd (htn nephrosclerosis) with right gc bleed with mass effect with mls 3.5mm with right umn facial nerve palsy		5	drowsy						yes		
34	986266	S	57	Female	2020054340	Dor	1 and 2		yes		yes			Type ii Dm with Htn with acc htn with acute cva- right hemiparesis with left gangliothalamic bleed with with ivh with mls 5mm with left umn facial nerve palsy		18	intubated from outside- drowsy							yes	
35	914846	GS	55	Male	2020017926	Discharged	1	yes						htn with acc htn with acute cva- left hemiplegia with right gc bleed with mass effect with mls of 5.6mm with right umn facial nerve palsy	10		NO								yes
36	934436	KK	62	Male	2020030443	Dor	1 and 2		yes		no			htn with acc htn with left thalmocapsular bleed with ivh with left umn facial nerve palsy	12		no					yes			
37	934452	ML	43	Male		Discharged	1		yes					type ii dm (hba1c: 7.8) with obesity with htn with acc htn with left gangliocapsular bleed with left umn facial nerve palsy	4		no			yes					
38	936410	NS	65	Male	2020031625	Dor	1 and 2		yes		yes			htn with acc htn with left thalmocapsular bleed with ivh with mls with left umn facial nerve palsy	6	4	yes- drowsy since 1 day pta							yes	
39	36654	VM	61	Male	2020036107	Discharged	1 and 2	yes			yes			type ii dm with htn with cld/ald with BA with ae with right gangliothalamic bleed with ivh with mls of 3mm	10	3	yes- drowsy since 1 day pta								yes
40	952414	SKS	57	Male	2020038778	Dor	1,2 and 4	yes			yes			htn with acute cva- left complete hemiplegia with right ganglio thalamic bleed and involving brainstem with ivh with mass effect with rt umn facial nerve palsy with HHD with conc lvh with cad with ef 38% with tpe I DD	10	11	yes- drowsy since few hrs pta								yes

					Comorbid disease								Personal history				DRUG HISTORY			General physical examination						
WEAKNESS	HEADACHE	VOMITING	SEIZURE	SPEECH DISTURBANCE																Sensorium	Vitals on admission					
					Diabetes mellitus	Dm	HTN	HTN	CAD	CAD	CKD	CLD	Vegetarian/Non veg	Smoker/Non smoker	Alcoholic/Non alcoholic		Anticoagulants	Antiplatelets	Antiplatelets		Pulse	SBP	DBP	MAP	RR	Temp
sudden onset left sided hemiplegia (both upper and lower limb) x few hrs pta	No	yes	NO	no	NO	no	no	no	no	NO	NO	NO	veg	no	no		no	no	no	drowsy but arousable	74	150	80	103	24	98.4
sudden onset left sided hemiplegia (both upper and lower limb) x 5 days pta	No	no	NO	yes	NO	no	yes (on ir	yes (on irregular t/t)	no	NO	NO	NO	non veg	no	no		no	no	no	drowsy but arousable	68	200	100	133	18	98.4
sudden onset left sided hemiplegia (both upper and lower limb) x 2hrs pta	No	no	NO	yes	yes since 20 yrs	yes	yes	yes since 20 yrs	no	NO	NO	NO	veg	no	no		no	no	no	drowsy but arousable	98	150	90	110	22	98.4
sudden onset left sided hemiplegia (both upper and lower limb) x few pta	No	no	NO	no	NO	no	no	no	no	NO	NO	NO	non veg	no	no		no	no	no	drowsy but arousable	64	200	100	133	24	101.6
sudden onset right sided hemiplegia since 2 days pta	No	no	NO	no	yes since 25 yrs	yes	yes	yes since 15 yrs	no	NO	NO	yes	veg	no	yes		no	no	no	drowsy but arousable	116	180	100	127	28	98.4
sudden onset left sided hemiplegia post hd	No	yes	NO	no	yes since 10yrs	yes	yes	yes since 5-8yrs	no	NO	yes	NO	veg	no	no		no	no	no	unconscious	102	180	90	120	20	98.4
sudden onset left sided hemiparesis since 3 days pta	yes	yes	NO	no	NO	no	yes	yes since 2yrs	no	NO	NO	NO	veg	no	no		no	no	no	conscious well oriented	74	160	100	120	20	98.4
sudden onset right sided hemiplegia since 5 days pta	No	no	NO	no	NO	no	yes (on ir	yes (on irregular t/t)	no	NO	NO	NO	veg	yes	no		no	no	no	drowsy but arousable	110	160	110	126.6	22	98.4
sudden onset right sided hemiparesis since 1 day pta	yes	yes	NO	no	NO	no	yes (on ir	yes (on irregular t/t)	no	NO	yes	NO	non veg	no	no		no	no	no	conscious well oriented	92	180	90	120	20	98.4
No	yes	yes	NO	no	NO	no	no	no	no	NO	NO	yes	veg	no	yes		no	no	no	unconscious	68	140	90	117	24	98.4
sudden onset left sided hemiparesis few hrs pta	No	no	NO	yes	NO	no	yes	yes since 6yrs	no	NO	yes	NO	veg	no	no		no	no	no	drowsy but arousable	68	160	100	120	22	98.4
sudden onset right sided hemiplegia since 1 day pta	No	no	NO	yes	yes since 1 year	yes	yes	yes since 1 yr	no	NO	NO	NO	veg	no	no		no	no	no	drowsy but arousable	92	210	110	143	20	98.4
sudden onset left sided hemiplegia since 1 day pta	No	yes	NO	yes	NO	no	yes (on ir	yes (on irregular t/t)	no	NO	NO	NO	non veg	no	no		no	no	no	conscious well oriented	72	180	80	113	18	98.4
sudden onset right sided hemiparesis since 1 day pta	No	no	NO	yes	NO	no	yes (on ir	yes (on irregular t/t)	no	NO	NO	NO	veg	no	no		no	no	no	conscious well oriented	88	200	120	147	22	98.4
right upper limb monoplegia few hrs pta	No	no	NO	yes	yes since 2 years	yes	yes	yes since 2 years	no	NO	NO	NO	veg	no	no		no	no	no	conscious well oriented	92	180	110	133	20	98.4
sudden onset right sided hemiplegia since 1 day pta	No	no	NO	yes	NO	no	yes (on ir	yes (on irregular t/t)	no	NO	NO	NO	non veg	no	no		no	no	no	drowsy but arousable	82	220	120	153	22	98.4
sudden onset left sided hemiplegia since 1 day pta	yes	yes	NO	no	yes since 7yrs (on mixtard 24u and 22u)	yes	yes	yes since 4months (on amlong 5mg)	no	NO	NO	yes	non veg	no	yes		no	no	no	drowsy but arousable	78	190	100	130	20	98.4
sudden onset left sided hemiplegia since few hrs pta	No	no	NO	yes	yes	yes	yes (on ir	yes (on irregular t/t)	yes	yes	NO	NO	veg	no	no		no	yes on single antiplatelet	yes on ecosprin 75mg	unconscious	66	200	120	147	22	98.4

						GCS on admission				Systemic CNS examination																	
										1. Higher mental function	2. Cranial nerves	3. Pupil												Deep tendon reflexes			
												Size		Reaction to light		Reaction to convergence		Tone (flacidity/ spasticity)		Power upper limb		Power lower limb		biceps		triceps	
Pallor	Icterus	Cyanosis	Clubbing	LAP	Edema – Pitting/not	gcs score	Eye	Verbal	Motor			Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left
NO	NO	NO	NO	NO	NO	9	3	1	5	drowsy	normal	2.5mm	2.5mm	reactive	Reactive	reactive	Reactive	normal	flaccid UL & LL	5-5	0/5	5-5	0/5	Normal	Absent	Normal	Absent
NO	NO	NO	NO	NO	NO	10	4	1	5	drowsy	left umn facial nerve palsy	2.5mm	2.5mm	reactive	Reactive	reactive	Reactive	normal	flaccid UL & LL	5-5	0/5	5-5	0/5	Normal	Absent	Normal	Absent
NO	NO	NO	NO	NO	NO	11	3	3	5	drowsy	left umn facial nerve palsy	2.5mm	2.5mm	reactive	Reactive	reactive	Reactive	normal	flaccid UL & LL	5-5	0/5	5-5	0/5	Normal	Absent	Normal	Absent
NO	NO	NO	NO	NO	NO	8	3	t	4	drowsy	normal	1.5mm	1.5mm	reactive	Reactive	reactive	Reactive	normal	flaccid UL & LL	(moving R>	0/5	3-5	0/5	Normal	Absent	Normal	Absent
NO	yes	NO	NO	NO	yes	10	3	2 then t	5	drowsy	normal	2.5mm	2.5mm	reactive	Reactive	reactive	Reactive	flaccid UL & LL	normal	0/5	(moving L>	0/5	4-5	Absent	Normal	Absent	Normal
yes	NO	NO	NO	NO	yes	3	1	t	1	Unconscious	normal	3.5mm	3.5mm	Non-Reactive	Non-Reactive	Non-Reactive	Non-Reactive	flaccid UL & LL	flaccid UL & LL	0/5	0/5	0/5	0/5	Absent	Absent	Absent	Absent
NO	NO	NO	NO	NO	NO	15	4	5	6	normal	normal	2.5mm	2.5mm	reactive	Reactive	reactive	Reactive	normal	normal	5-5	4-5	5-5	4-5	Normal	Normal	Normal	Normal
NO	NO	NO	NO	NO	NO	9	3	1	5	drowsy	normal	2.3mm	1mm	reactive	Non-Reactive	reactive	Non-Reactive	flaccid UL & LL	normal	0/5	5-5	0/5	5-5	Absent	Normal	Absent	Normal
yes	NO	NO	NO	NO	NO	15	4	5	6	normal	normal	2.5mm	2.5mm	reactive	Reactive	reactive	Reactive	normal	normal	4-5	5-5	4-5	5-5	Normal	Normal	Normal	Normal
yes	yes	NO	NO	NO	yes	4	1	t	2	Unconscious	normal	1.5mm	1.5mm	Non-Reactive	Non-Reactive	Non-Reactive	Non-Reactive	flaccid UL & LL	flaccid UL & LL	0/5	0/5	0/5	0/5	Absent	Absent	Absent	Absent
NO	NO	NO	NO	NO	NO	8	2	2	4	drowsy	left umn facial nerve palsy	2.5mm	1.5mm	reactive	Reactive	reactive	Reactive	normal	flaccid UL & LL	5-5	2-5	5-5	3-5	Normal	Absent	Normal	Absent
NO	NO	NO	NO	NO	NO	7	4 outsi	came intub	4	drowsy	rt umn facial nerve palsy	2.5mm	2.5mm	reactive	Reactive	reactive	Reactive	flaccid UL & LL	normal	0/5	5-5	0/5	5-5	Absent	Normal	Absent	Normal
NO	NO	NO	NO	NO	NO	15	4	5	6	normal	left umn facial nerve palsy	2.5mm	2.5mm	reactive	Reactive	reactive	Reactive	normal	flaccid UL & LL	5-5	0/5	5-5	0/5	Normal	Absent	Normal	Absent
NO	NO	NO	NO	NO	NO	15	4	5	6	normal	rt umn facial nerve palsy	2.5mm	2.5mm	reactive	Reactive	reactive	Reactive	flaccid	normal	3-5	5-5	4-5	5-5	Absent	Normal	Absent	Normal
NO	NO	NO	NO	NO	NO	15	4	5	6	normal	rt umn facial nerve palsy	2.5mm	2.5mm	reactive	Reactive	reactive	Reactive	flaccid UL	normal	0/5	5-5	5-5	5-5	Absent	Normal	Absent	Normal
NO	NO	NO	NO	NO	NO	12	3	4	5	drowsy	rt umn facial nerve palsy	2.5mm	2.5mm	reactive	Reactive	reactive	Reactive	flaccid UL & LL	normal	0/5	5-5	0/5	5-5	Absent	Normal	Absent	Normal
yes	NO	NO	NO	NO	NO	12	3	4	5	drowsy	normal	2.5mm	2.5mm	reactive	Reactive	reactive	Reactive	normal	flaccid UL & LL	5-5	0/5	5-5	0/5	Normal	Absent	Normal	Absent
NO	NO	NO	NO	NO	NO	4	1	t	2	Unconscious	left umn facial nerve palsy	2.5mm	1.5mm	sluggishly reacting	sluggishly reacting	sluggishly reacting	sluggishly reacting	flaccid UL & LL	flaccid UL & LL	2-5	0/5	2-5	0/5	Absent	Absent	Absent	Absent

																INVESTIGATIONS											
						superficial reflexes								5. sensory system	6. cerebellar signs	HEMOGRAM										LFT	
suppinator		knee		ankle		upper abdominal		lower abdominal		cremasteric		Plantar				TLC		HB		MCV		MCH		PLATELET		TOTAL BILIRUBIN	
Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left			At admission	At discharge	At admission	At discharge	At admission	At discharge	At admission	At discharge	At admission	At discharge	At admission	At discharge
Normal	Absent	Normal	Absent	Normal	Absent	Normal	Normal	Normal	Normal	Normal	Normal	flexor	extensor	Normal	normal	11.7	10.2	11.9	10.8	81.6	81.3	27	26.8	200	246	0.86	na
Normal	Absent	Normal	Absent	Normal	Absent	Normal	Normal	Normal	Normal	Normal	Normal	flexor	extensor	Normal	normal	11.1	8.4	14	13.8	84.1	84.3	26.7	26.8	186	325	0.42	na
Normal	Absent	Normal	Absent	Normal	Absent	Normal	Normal	Normal	Normal	Normal	Normal	mute	extensor	Normal	normal	8.8	7.2	10.8	10.5	70.5	70.3	21.6	21.3	152	180	0.72	na
Normal	Absent	Normal	Absent	Normal	Absent	Normal	Normal	Normal	Normal	Normal	Normal	extensor	extensor	Normal	normal	13.6	11.5	12.9	11.8	85.7	85.2	27.6	27.4	150	180	0.51	na
Absent	Normal	Absent	Normal	Absent	Normal	Normal	Normal	Normal	Normal	Normal	Normal	extensor	flexor	Normal	normal	14.5	24	13.8	11.9	99.9	98.8	32.1	32.3	217	259	1.77	na
Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	mute	mute	Can't be assesed	Can't be assesed	14.2	na	9.8	na	87	na	27.4	na	138	na	0.42	na
Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	flexor	flexor	Normal	present	14.5	10.2	13.4	13.1	83.4	83.2	28.4	28.1	263	250	0.7	na
Absent	Normal	Absent	Normal	Absent	Normal	Normal	Normal	Normal	Normal	Normal	Normal	extensor	flexor	Normal	normal	12.8	9.2	13.7	13.2	103.8	97.1	33.7	31.8	80	150	0.48	na
Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	flexor	flexor	Normal	present	11.9	9.2	9.1	9.8	92.9	88.8	29.1	29.3	120	180	0.64	na
Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	mute	mute	Can't be assesed	normal	24.6	20.9	9	7.8	107.7	103.5	36.6	35.2	130	118	0.62	0.89
Normal	Absent	Normal	Absent	Normal	Absent	Normal	Normal	Normal	Normal	Normal	Normal	flexor	extensor	Normal	normal	11.9	12.4	13	11.8	93.3	92.6	30.2	29.9	140	110	0.61	na
Absent	Normal	Absent	Normal	Absent	Normal	Normal	Normal	Normal	Normal	Normal	Normal	extensor	flexor	Normal	normal	14.4	25.9	12.3	10.5	77.3	77.1	24.8	24.2	135	125	0.28	na
Normal	Absent	Normal	Absent	Normal	Absent	Normal	Normal	Normal	Normal	Normal	Normal	flexor	extensor	Normal	normal	13.1	8.6	12.5	12.1	94.1	94.3	30.8	30.7	332	368	0.96	na
Absent	Normal	Absent	Normal	Absent	Normal	Normal	Normal	Normal	Normal	Normal	Normal	extensor	flexor	Normal	normal	12.3	7.4	11.9	11.5	98.5	98.3	31.7	31.6	283	322	0.67	na
Absent	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	extensor	flexor	Normal	normal	9	8.8	13.5	13.1	76.2	76.1	25.5	25.2	278	290	0.53	na
Absent	Normal	Absent	Normal	Absent	Normal	Normal	Normal	Normal	Normal	Normal	Normal	extensor	mute	Normal	normal	11.3	7.6	15.3	13.1	97.4	96.8	33.9	33.1	135	189	0.46	na
Normal	Absent	Normal	Absent	Normal	Absent	Normal	Normal	Normal	Normal	Normal	Normal	flexor	extensor	Normal	normal	9.9	7.8	12	10.6	84.4	84.1	28.8	28.5	195	148	1.88	na
Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	mute	extensor	Normal	normal	10.2	8.5	13.5	11.2	96.6	95.8	31.7	31.2	234	355	0.54	na

												RFT						Lipid profile							
DIRECT BILIRUBIN		SGOT/SGPT		ALP		TOTAL PROTEIN		SERUM ALBUMIN		PTI/ INR		BLOOD UREA		SERUM CREATININE		Serum electrolytes(		CHOLESTEROL(T)		Triglycerides		cholesterol (HDL)		cholesterol (LDL)	
At admission	At discharge	At admission	At discharge	At admission	At discharge	At admission	At discharge	At admission	At discharge	At admission	At discharge	At admission	At discharge	At admission	At discharge	At admission	At discharge	At admission	At discharge	At admission	At discharge	At admission	At discharge	At admission	At discharge
0.32	na	30/26	na	98	na	8	na	4.11	na	1.12	na	26	29	0.6	0.55	134/4.10/96	138/4.02/98	na	na	na	na	na	na	na	na
0.15	na	25/27	na	96	na	8.03	na	4.23	na	1.16	na	62	na	0.62	na	137/4/100	na	na	na	na	na	na	na	na	na
0.33	na	30/14	na	138	na	6.1	na	3.25	na	1.13	na	22	na	0.64	na	137/3.88/101	139/4.36/100	na	na	na	na	na	na	na	na
0.1	na	47/51	32/43	102	na	7.1	na	4.4	na	1.17	1.2	27	48	0.9	0.77	144/3.3/106	138/3.99/99	na	na	na	na	na	na	na	na
0.55	na	231/58	na	533	na	7.9	na	3.12	na	1.55	1.66	59	75	1.27	1.68	141/4.16/105	143/3.43/110	na	na	na	na	na	na	na	na
0.06	na	22/16	na	165	na	7.7	na	3.29	na	0.99	na	60	na	3.08	na	133/2.75/99	na	na	na	na	na	na	na	na	na
0.34	na	43/46	na	92	na	7.7	na	4.62	na	1.27	na	36	48	0.75	0.62	128/2.97/83	135/3.99/99	na	na	na	na	na	na	na	na
0.16	na	29/42	na	104	na	7.5	na	4.25	na	1.18	na	56	32	1	0.69	150/3.31/111	140/4.1/106	na	na	na	na	na	na	na	na
0.12	na	88/39	na	97	na	6.9	na	3.52	na	1.23	na	120	110	7.15	7.59	145/4.1/115	134/3.56/98	na	na	na	na	na	na	na	na
0.2	0.25	93/41	105/52	118	na	6.6	na	2.34	2.02	2.69	2.38	24	20	0.93	1	135/3.91/100	138/4.31/98	na	na	na	na	na	na	na	na
0.13	na	29/21	na	69	na	7.5	na	3.94	na	1.02	na	22	38	0.64	0.89	139/4.53/103	144/4.08/101	na	na	na	na	na	na	na	na
0.15	na	18/8	na	91	na	7.6	na	4.41	na	1.13	na	22	25	0.71	0.56	139/3.72/100	141/3.85/104	na	na	na	na	na	na	na	na
0.14	na	40/20	na	62	na	7.2	na	3.95	na	1.05	na	19	36	0.76	0.85	141/4.63/105	140/4.02/101	na	na	na	na	na	na	na	na
0.11	na	42/48	na	131	na	7.9	na	4.68	na	1	na	23	35	0.95	0.82	140/4.10/100	142/3.89/99	174	na	378	na	38	na	97	na
0.17	na	23/23	na	98	na	7.7	na	5	na	1.07	na	21	34	0.8	0.76	143/3.15/98	138/3.78/101	186	na	159	na	33	na	125	na
0.15	na	24/29	na	94	na	7.2	na	4.35	na	1.26	na	43	na	0.93	na	143/3.58/100	138/3.06/99	na	na	na	na	na	na	na	na
0.81	na	23/14	na	125	na	6.3	na	4.09	na	1.26	na	14	38	0.57	0.68	141/3.63/105	138/4.23/100	na	na	na	na	na	na	na	na
0.16	na	39/51	na	56	na	7.3	na	4.68	na	1.17	na	25	37	1.15	0.89	140/3.89/101	135/4.08/99	na	na	na	na	na	na	na	na

ICH score at presentation							CT angio with venous cuts	MRI angio with venous cuts	2D ECHO	surgery	Surgical intervention	Morbidity outcome at discharge Using Modified Rankin Scale (mRS)	FOLLOW UP	
Age >= 80 years	Glasgow coma scale (GCS) at presentation	Volume of hematoma on baseline CT scan of brain by ABC/2 formula		Location of hematoma (infratentorial or supratentorial)	Presence of intraventricular extension	Total Score							At 30 days using Modified Rankin Scale (mRS)	At 60 days using Modified Rankin Scale (mRS)
			ICH volume	Infratentorial origin										
no (score 0)	gcs: 9 (score 1)	1	30.096 cm3 (score 1)	no (score 0)	yes (score 1)	3	not done	not done	conc lvh with ef 60%, sclerotic aortic valve, type I LV DD	no	no	e4v1m6, score 5	score 4	score 4
no (score 0)	gcs: 10 (score 1)	0	13.53 cm3 (score 0)	no (score 0)	no (score 0)	1	not done	not done	conc lvh with ef 60%	no	no	e4v5m6, score 4	score 4	score 4
yes (score 1)	gcs: 11 (score 1)	0	6.66 cm3 (score 0)	no (score 0)	no (score 0)	2	not done	not done	na	no	no	score 4	score 4	score 4
no (score 0)	gcs: 8 (score 1)	0	3.64 cm3 (score 0)	yes (score 1)	yes (score 1)	3	not done	not done	na	no	no	score 5	score 4	score 4
yes (score 1)	gcs: 10 (score 1)	0	12.67 cm3 (score 0)	no (score 0)	yes (score 1)	3	not done	not done	na	no	no	score 6		
no (score 0)	gcs: 3 (score 2)	1	score 1	yes (score 1)	yes (score 1)	5	not done	not done	na	no	no	score 5	score 6	
no (score 0)	gcs: 15 (score 0)	0	7.656 cm3 (score 0)	yes (score 1)	yes (score 1)	2	not done	not done	na	no	no	score 3	score 2	score 2
no (score 0)	gcs: 9 (score 1)	0	18.14 cm3 (score 0)	no (score 0)	no (score 0)	1	not done	not done	na	no	no	score 4	score 4	score 4
no (score 0)	gcs: 15 (score 0)	0	23.936 (score 0)	yes (score 1)	no (score 0)	1	not done	not done	conc lvh with ef 60%	no	no	score 3	score 3	score 2
no (score 0)	gcs: 4 (score 2)	0	18.9 cm 3 (score 0)	no (score 0)	yes (score 1)	3	not done	not done	conc lvh with ef 60%	yes	yes- post evd insertion	score 6		
no (score 0)	gcs: 8 (score 1)	1	score 1	no (score 0)	yes (score 1)	3	not done	not done	na	no	no	score 5	score 4	score 4
no (score 0)	gcs: 7 (score 1)	0	10.74 cm3 (score 0)	no (score 0)	yes (score 1)	2	not done	not done	conc lvh with ef 55%	no	no	score 5	score 5	score 4
no (score 0)	gcs: 15 (score 0)	0	13.480 (score 0)	no (score 0)	no (score 0)	0	not done	not done	na	no	no	score 4	score 4	score 4
no (score 0)	gcs: 15 (score 0)	0	14.4 cm3 (score 0)	no (score 0)	no (score 0)	0	not done	not done	na	no	no	score 4	score 3	score 1
no (score 0)	gcs: 15 (score 0)	0	score 0	no (score 0)	no (score 0)	0	not done	not done	na	no	no	score 3	score 2	score 1
no (score 0)	gcs: 12 (score 1)	0	10.368 cm3 (score 0)	no (score 0)	yes (score 1)	2	not done	not done	na	no	no	score 4	score 4	score 4
no (score 0)	gcs: 12 (score 1)	1	score 1	no (score 0)	yes (score 1)	3	not done	not done	na	no	no	score 4	score 4	score 4
no (score 0)	gcs: 4 (score 2)	1	score 1	yes (score 1)	yes (score 1)	5	not done	not done	cad with ef 38% with type I dd	yes	yes	score 5	score 5	score 4

Sr. No	MRD No	Name	Age	Gender	Admn No	Outcome of the patient	Site of bleed (gangliocapsular-1, Thalamic - 2 , cerebellum - 3, Pontine/brainstem - 4 , cortical/atypical - 5)	Side of bleed			IVH yes/NO	Hydrocephalus	coagulopathy	Outcome diagnosis	Length of stay (In Days)		CNS Symptoms								
																	ALTERED SENSORIUM	WEAKNESS							
																		MONOPARESİS		MONOPLEGIA		HEMIPARESIS		HEMIPLEGIA	
								RIGHT	LEFT	B/l					In Ward	In ICU		RT	LT	RT	LT	RT	LT	RT	LT
41	920891	PK	45	Female	2020041026	Discharged	2 and 4			B/l	yes			htn with acc htn with acute cva-b/l thalamic bleed (L>R) with brainstem bleed (pons and medulla on left side) with htn nephrosclerosis	8	9	yes- drowsy since 1 day pta							yes	
42	954450	JR	70	Male	2020039529	Discharged	5		yes		yes		present	cld with coagulopathy with acute cva- right complete hemiplegia- left ftp ich with gtcs episodes with global aphasia	9		drowsy							yes	
43	993194	NS	48	Male	2020057272	Discharged	5		yes					htn with acc htn with acute cva- left temporo-occipital bleed	4	3	yes- drowsy since 8 days (admitted outside)					yes			
44	994297	D	47	Male	2020057745	Discharged	1		yes		yes			htn with acc htn with acute cva- right hemiplegia with left gc bleed with mass effect with mls 5.5mm	7	4	drowsy							yes	
45	1003596	PD	50	Female	2020061354	Discharged	5		yes					htn with acc htn with left temporooccipital ich (? Amyloid angiopathy)	8		no	yes							
46	1004546	KC	54	Male	2020061699	Discharged	1	yes						htn with acc htn with rt gc bleed with rt umn facial n palsy	7		NO		yes						
47	1004566	VS	35	Male	2020061715	Discharged	1 and 2		yes					htn with acc htn with left small gangliothalamic bleed with left umn facial nerve palsy	4		NO								
48	1005290	RS	36	Male	2020062028	Discharged	1		yes					htn with acc htn with acute cva- right hemiplegia with left gc bleed	7		NO							yes	
49	1004918	GS	57	Male	2020061889	Discharged	1		yes		yes			htn with acc htn with acute cva- right hemiplegia with left gc bleed with ivh with mls of 2mm with left umn facial nerve palsy	9	6	drowsy few hrs pta							yes	
50	1003887	VS	72	Male	2020061463	Dama	5		yes		yes			type ii dm with htn with left fronto-temporal ich with ivh with mass effect		4	unconscious few hrs pta								
51	1036426	ML	63	Male	2021011005	Dama	1,2 and 4	yes			yes			htn with acc htn with right thalmocapsular and brainstem bleed with hcv reactive with cld with aki		4	unconscious (altered sensorium since few hrs pta)								yes
52	1043528	SK	52	Female	2021012318	Discharged	1		yes					left gc bleed with left umn facial nerve palsy	6		no			yes					
53	1044041	MK	82	Female	2021012398	Discharged	1,2 and 4	yes			yes			right thalmocapsular bleed involving mid brain with mass effect with minimal ivh with right umn facial nerve palsy	9		drowsy								yes
54	1047355	D	72	Male	2021013053	Discharged	5	yes			yes			htn with acc htn with right temporal lobe bleed with ivh	5	3	drowsy								yes
55	1054168	JK	60	Female	2021014344	Discharged	1 and 2	yes			yes			htn with acc htn with right gangliothalamic bleed with right umn facial nerve palsy	7	5	drowsy since 1 day pta								yes
56	1073325	BS	37	Male	2021017752	Discharged	1		yes		yes			left gc bleed with ivh with mass effect	9	7	drowsy							yes	
57	1090400	BY	35	Female	2021020985	Discharged	1		yes		yes			htn with acc htn with left gc bleed with left umn facial nerve palsy	7		drowsy since few hrs pta					yes			
58	1126174	P	82	Female	2021030736	Death	5	yes			yes			htn with acc htn with right parietal region ich with ivh with mls (on ecosprin)		7	drowsy since 1 day pta								yes
59	1268027	RK	51	Female	2021027655	Dama	1	yes			yes			htn with ckd with right gc bleed with ivh with mass effect			became drowsy during hospitalisation								yes
60	1145701	YS	45	Male	2021038459	Discharged	1	yes						htn with acc htn with right lentiform nucleus bleed with mass effect with right umn facial nerve palsy	9	6	drowsy since 1 day pta						yes		
61	1148416	SG	64	Male	2021039545	Discharged	2 and 4	yes			yes	present		type ii dm with htn with acc htn with right thalamic and midbrain bleed with ivh with right umn facial nerve palsy with non communicating hydrocephalus	7	12	drowsy since 6hrs pta						yes		

					Comorbid disease								Personal history				DRUG HISTORY			General physical examination						
WEAKNESS	HEADACHE	VOMITING	SEIZURE	SPEECH DISTURBANCE	Diabetes mellitus	Dm	HTN	HTN	CAD	CAD	CKD	CLD	Vegetarian/Non veg	Smoker/Non smoker	Alcoholic/Non alcoholic		Anticoagulants	Antiplatelets	Antiplatelets	Sensorium	Vitals on admission					
																					Pulse	SBP	DBP	MAP	RR	Temp
sudden onset right sided hemiplegia since 2 days pta	No	no	NO	no	yes	yes	yes	yes	no	NO	yes	NO	veg	no	no		no	yes on single antiplatelet	yes on ecosprin 150mg	drowsy but arousable	88	190	100	130	18	98.4
sudden onset right sided hemiplegia since few hrs pta	yes	yes	yes(gtcs)	global aphasia	NO	no	no	no	no	NO	NO	yes	veg	no	yes		no	no	no	drowsy but arousable	96	150	80	103	18	98.4
sudden onset right upper and lower limb (UL> LL)weakness since 1 day pta	yes	yes	NO	no	NO	no	yes (on ir	yes (on irregular t/t)	no	NO	NO	NO	veg	no	no		no	no	no	drowsy but arousable	82	180	100	127	24	98.4
sudden onset hemiplegia of right side of body x 3hrs pta	No	no	NO	broca's aphasia	NO	no	yes	yes since 1 year	no	NO	NO	NO	non veg	no	yes		no	no	no	drowsy but arousable	96	220	110	147	18	98.4
sudden onset monoparesis right upper limb since 1 day pta	yes	yes	NO	no	NO	no	yes (on ir	yes (on irregular t/t)	no	NO	NO	NO	veg	no	no		no	no	no	conscious well oriented	94	180	90	120	18	98.4
sudden onset left UL weakness since 1 day pta	No	no	NO	yes	NO	no	yes (on ir	yes (on irregular t/t)	no	NO	NO	NO	veg	no	no		no	no	no	conscious well oriented	94	240	160	187	18	98.4
transient right upper and lower limb weakness 2hrs pta	No	no	NO	yes	NO	no	yes (on ir	yes (on irregular t/t)	no	NO	NO	NO	veg	no	no		no	no	no	conscious well oriented	82	160	90	113	18	98.4
sudden onset right sided hemiplegia since few hrs pta	No	no	NO	broca's aphasia	NO	no	yes (on ir	yes (on irregular t/t)	no	NO	NO	NO	non veg	no	no		no	no	no	conscious well oriented	84	160	100	120	22	98.4
sudden onset right sided hemiplegia since few hrs pta	No	no	NO	yes	yes	yes	yes	yes	no	NO	NO	NO	non veg	no	no		no	no	no	drowsy but arousable	97	160	90	113	22	98.4
No	No	no	NO	no	yes since 10 yrs	yes	yes	yes since 10 yrs	no	NO	yes	NO	veg	yes	yes		no	no	no	unconscious	62	150	90	110	24	98.4
sudden onset left sided hemiplegia few hrs pta	No	no	NO	no	yes	yes	yes (on ir	yes (on irregular t/t)	no	NO	NO	NO	veg	yes	yes		no	no	no	unconscious	69	190	100	130	22	98.4
right monoplegia (UL)	No	no	NO	yes	NO	no	yes (on ir	yes (on irregular t/t)	no	NO	NO	NO	veg	no	no		no	no	no	conscious well oriented	88	180	90	120	20	98.4
left hemiplegia	No	no	NO	yes	yes	yes	yes (on ir	yes (on irregular t/t)	no	NO	NO	NO	veg	no	no		no	no	no	drowsy but arousable	114	160	100	120	24	98.4
left hemiplegia	No	yes	NO	no	yes	yes	yes (on ir	yes (on irregular t/t)	no	NO	yes	NO	veg	no	no		no	no	no	drowsy but arousable	102	170	80	110	22	98.4
sudden onset left sided hemiplegia since 1 day pta	No	no	NO	yes	NO	no	yes	yes	no	NO	NO	NO	veg	no	no		no	no	no	drowsy but arousable	72	150	90	110	20	98.4
right hemiplegia	yes	yes	NO	no	NO	no	no	no	no	NO	NO	NO	non veg	no	no		no	no	no	drowsy but arousable	82	180	90	120	20	98.4
sudden onset right sided hemiparesis since few hrs pta	no	no	NO	yes	NO	no	yes (on ir	yes (on irregular t/t)	no	NO	no	no	veg	no	no		no	no	no	drowsy but arousable	80	160	90	113	18	98.4
sudden onset left sided hemiplegia since 1 day pta	No	No	NO	no	yes	yes	yes (on ir	yes (on irregular t/t)	yes	yes	no	no	veg	no	no		no	yes on single antiplatelet	yes on ecosprin 75mg	drowsy but arousable	72	160	70	100	22	98.4
sudden onset left sided hemiplegia during hospitalisation	No	No	NO	no	NO	no	yes	yes	no	NO	yes	no	veg	no	no		no	no	no	unconscious	76	220	110	147	24	98.4
sudden onset left sided hemiparesis since 1 day pta	No	No	NO	yes	NO	no	yes (on ir	yes (on irregular t/t)	no	NO	no	no	veg	no	no		no	no	no	drowsy but arousable	87	180	100	127	20	98.4
sudden onset left sided hemiparesis since 10hrs pta	No	No	NO	yes	yes	yes	yes	yes	no	NO	NO	NO	veg	no	no		no	no	no	drowsy but arousable	84	200	120	147	24	98.4

						GCS on admission				Systemic CNS examination																	
										1. Higher mental function	2. Cranial nerves	3. Pupil												Deep tendon reflexes			
												Size		Reaction to light		Reaction to convergence		Tone (flacidity/ spasticity)		Power upper limb		Power lower limb		biceps		triceps	
Pallor	Icterus	Cyanosis	Clubbing	LAP	Edema – Pitting/not	gcs score	Eye	Verbal	Motor			Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left
yes	NO	NO	NO	NO	NO	9	2	3	4	drowsy	normal	2.5mm	2.5mm	reactive	Reactive	reactive	Reactive	flaccid UL & LL	flaccid UL & LL	0/5	3-5	0/5	3-5	Absent	Absent	Absent	Absent
yes	yes	NO	NO	NO	NO	8	3	1 (global ap	4	drowsy	normal	2.5mm	2.5mm	reactive	Reactive	reactive	Reactive	flaccid UL & LL	normal	0/5	5-5	0/5	5-5	Absent	Normal	Absent	Normal
NO	NO	NO	NO	NO	NO	9	3	2	4	drowsy	normal	2.5mm	2.5mm	reactive	Reactive	reactive	Reactive	flaccid UL & LL	normal	0/5	5-5	3-5	5-5	Absent	Normal	Absent	Normal
NO	NO	NO	NO	NO	NO	10	3	1	6	drowsy	normal	2.5mm	2.5mm	reactive	Reactive	reactive	Reactive	flaccid UL & LL	normal	0/5	5-5	0/5	5-5	Absent	Normal	Absent	Normal
NO	NO	NO	NO	NO	NO	15	4	5	6	normal	normal	2.5mm	2.5mm	reactive	Reactive	reactive	Reactive	flaccid UL	normal	3-5	5-5	5-5	5-5	Absent	Normal	Absent	Normal
NO	NO	NO	NO	NO	NO	15	4	5	6	normal	left umn facial nerve palsy	2.5mm	2.5mm	reactive	Reactive	reactive	Reactive	normal	normal	5-5	4-5	5-5	5-5	Normal	Normal	Normal	Normal
NO	NO	NO	NO	NO	NO	15	4	5	6	normal	rt umn facial nerve palsy	2.5mm	2.5mm	reactive	Reactive	reactive	Reactive	normal	normal	5-5	5-5	5-5	5-5	Normal	Normal	Normal	Normal
NO	NO	NO	NO	NO	NO	11	4	1	6	normal	normal	2.5mm	2.5mm	reactive	Reactive	reactive	Reactive	flaccid UL & LL	normal	0/5	5-5	0/5	5-5	Absent	Normal	Absent	Normal
NO	NO	NO	NO	NO	NO	9	3	1	5	drowsy	rt umn facial nerve palsy	2.5mm	2.5mm	reactive	Reactive	reactive	Reactive	flaccid UL & LL	normal	0/5	5-5	0/5	5-5	Absent	Normal	Absent	Normal
NO	NO	NO	NO	NO	NO	4	1	t	2	Unconscious	normal	2.5mm	2.5mm	reactive	reactive	reactive	Reactive	flaccid UL & LL	flaccid UL & LL	0/5	0/5	0/5	0/5	Absent	Absent	Absent	Absent
NO	NO	NO	NO	NO	NO	3	1	t	1	Unconscious	normal	1.5mm	2.5mm	reactive	Reactive	reactive	Reactive	normal	flaccid UL & LL	3-5	0/5	3-5	0/5	Normal	Absent	Normal	Absent
NO	NO	NO	NO	NO	NO	15	4	5	6	normal	rt umn facial nerve palsy	2.5mm	2.5mm	reactive	Reactive	Reactive	Reactive	flaccid UL	normal	0/5	5-5	5-5	5-5	Absent	Normal	Absent	Normal
NO	NO	NO	NO	NO	NO	12	3	4	5	drowsy	left umn facial nerve palsy	2.5mm	2.5mm	reactive	reactive	reactive	reactive	normal	flaccid UL & LL	5-5	0/5	5-5	0/5	Normal	Absent	Normal	Absent
yes	NO	NO	NO	NO	yes	12	3	3	6	drowsy	normal	2.5mm	2.5mm	reactive	reactive	reactive	reactive	normal	flaccid UL & LL	5-5	0/5	5-5	0/5	Normal	Absent	Normal	Absent
NO	NO	NO	NO	NO	NO	11	3	2	6	drowsy	left umn facial nerve palsy	2.5mm	2.5mm	reactive	reactive	reactive	reactive	normal	flaccid UL & LL	5-5	0/5	5-5	0/5	Normal	Absent	Normal	Absent
NO	NO	NO	NO	NO	NO	11	3	3	5	drowsy	normal	2.5mm	2.5mm	reactive	reactive	reactive	reactive	flaccid UL & LL	normal	0/5	5-5	0/5	5-5	Absent	Normal	Absent	Normal
NO	NO	NO	NO	NO	NO	10	3	2	5	drowsy	rt umn facial nerve palsy	2.5mm	2.5mm	reactive	reactive	reactive	reactive	flaccid UL & LL	normal	0/5	5-5	3-5	5-5	Absent	Normal	Absent	Normal
NO	NO	NO	NO	NO	no	9	3	1	5	drowsy	normal	2.5mm	2.5mm	reactive	reactive	reactive	reactive	normal	flaccid UL & LL	5-5	0/5	5-5	0/5	Normal	Absent	Normal	Absent
yes	NO	NO	NO	NO	no	4	3 then	2 then t	6 then 2	Unconscious	normal	2.5mm	2.5mm	reactive	reactive	reactive	reactive	flaccid UL & LL	flaccid UL & LL	0/5	0/5	0/5	0/5	Absent	Absent	Absent	Absent
NO	NO	NO	NO	NO	no	13	3	4	6	drowsy	left umn facial nerve palsy	2.5mm	2.5mm	reactive	reactive	reactive	reactive	normal	flaccid UL & LL	5-5	1-5	5-5	3-5	Normal	Absent	Normal	Absent
NO	NO	NO	NO	NO	NO	9	4	1	4	drowsy	left umn facial nerve palsy	2.5mm	2.5mm	reactive	reactive	reactive	reactive	normal	flaccid UL & LL	4-5	1-5	4-5	1-5	Normal	Absent	Normal	Absent

																INVESTIGATIONS											
						superficial reflexes								5. sensory system	6. cerebellar signs	HEMOGRAM										LFT	
suppinator		knee		ankle		upper abdominal		lower abdominal		cremasteric		Plantar				TLC		HB		MCV		MCH		PLATELET		TOTAL BILIRUBIN	
Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left			At admission	At discharge	At admission	At discharge	At admission	At discharge	At admission	At discharge	At admission	At discharge	At admission	At discharge
Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	extensor	extensor	Normal	normal	12.4	6.9	14.9	12.5	86.3	85.8	29.3	28.7	191	205	1.2	na
Absent	Normal	Absent	Normal	Absent	Normal	Normal	Normal	Normal	Normal	Normal	Normal	extensor	flexor	Normal	normal	7.5	16.4	11.6	11.7	106.3	106.4	34.5	34.2	92	100	3.93	2.43
Absent	Normal	Absent	Normal	Absent	Normal	Normal	Normal	Normal	Normal	Normal	Normal	mute	flexor	Normal	normal	9.2	8.7	12.5	12.5	64.4	64.2	19.9	19.5	213	285	0.71	na
Absent	Normal	Absent	Normal	Absent	Normal	Normal	Normal	Normal	Normal	Normal	Normal	extensor	flexor	Normal	normal	10	9.6	13.4	12.4	94.5	93.6	31.2	30.9	130	145	0.84	na
Absent	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	extensor	flexor	Normal	normal	6.7	8.2	11.5	11.1	92.3	92.1	30.2	29.9	173	236	0.87	na
Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	flexor	extensor	Normal	normal	11	9.8	15.2	14.8	91	91.3	29.8	29.7	150	185	0.41	na
Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	flexor	flexor	Normal	normal	11.9	7.5	13.7	13.5	86.9	86.2	31.6	31.5	187	215	1.2	na
Absent	Normal	Absent	Normal	Absent	Normal	Normal	Normal	Normal	Normal	Normal	Normal	extensor	flexor	Normal	normal	11.3	8.4	18.9	14.4	85.3	84.8	27.7	27.2	136	185	0.51	na
Absent	Normal	Absent	Normal	Absent	Normal	Normal	Normal	Normal	Normal	Normal	Normal	extensor	flexor	Normal	normal	7	8.2	13.1	12.5	91.2	89.9	30.9	30.5	235	254	0.29	na
Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	mute	mute	Can't be assesed	normal	10.6	14	13.7	11.8	101	98.3	34.4	33.5	90	95	1.97	na
Normal	Absent	Normal	Absent	Normal	Absent	Normal	Normal	Normal	Normal	Normal	Normal	mute	extensor	Can't be assesed	normal	8.1	13.8	13.5	12.6	80.7	80.2	24.9	24.3	150	110	0.56	na
Absent	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	extensor	flexor	Normal	normal	11	7.4	13.5	13.1	90.4	90.1	29.6	29.5	195	244	1.56	na
Normal	Absent	Normal	Absent	Normal	Absent	Normal	Normal	Normal	Normal	Normal	Normal	flexor	extensor	Normal	normal	9.1	8.2	12.7	12.4	86.4	86.1	28.2	28.1	270	340	0.25	na
Normal	Absent	Normal	Absent	Normal	Absent	Normal	Normal	Normal	Normal	Normal	Normal	flexor	extensor	Normal	normal	14.1	10.2	9.9	8.5	92.1	91.7	29.8	29.6	176	202	0.57	na
Normal	Absent	Normal	Absent	Normal	Absent	Normal	Normal	Normal	Normal	Normal	Normal	flexor	extensor	Normal	Normal	9.7	8.2	15.6	14.8	86.7	86.2	28.8	28.5	180	210	0.45	na
Absent	Normal	Absent	Normal	Absent	Normal	Normal	Normal	Normal	Normal	Normal	Normal	extensor	flexor	Normal	normal	28.3	6.5	17.5	13.6	86.9	86.2	28.1	28.3	162	202	0.49	na
Absent	Normal	Absent	Normal	Absent	Normal	Normal	Normal	Normal	Normal	Normal	Normal	extensor	flexor	Normal	Normal	8.7	5.9	18.5	16.2	92.8	92.1	30.5	30.2	262	298	0.58	na
Normal	Absent	Normal	Absent	Normal	Absent	Normal	Normal	Normal	Normal	Normal	Normal	flexor	extensor	normal	normal	15.6	17.1	13.4	13.2	82.1	79.4	25.5	24.1	201	206	0.62	na
Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	mute	mute	Can't be assesed	Can't be assesed	18.8	19.5	8.5	7.6	80.2	80.6	28.8	28.5	162	149	0.86	na
Normal	Absent	Normal	Absent	Normal	Absent	Normal	Normal	Normal	Normal	Normal	Normal	flexor	extensor	normal	normal	8.6	7.2	14.3	14.1	99.9	99.5	32.8	32.3	243	366	0.17	na
Normal	Absent	Normal	Absent	Normal	Absent	Normal	Normal	Normal	Normal	Normal	Normal	mute	extensor	normal	normal	15.4	10.1	11.5	10.4	70.6	70.1	22.6	21.9	180	210	0.68	na

												RFT						Lipid profile							
DIRECT BILIRUBIN		SGOT/SGPT		ALP		TOTAL PROTEIN		SERUM ALBUMIN		PTI/ INR		BLOOD UREA		SERUM CREATININE		Serum electrolytes(		CHOLESTEROL(T)		Triglycerides		cholesterol (HDL)		cholesterol (LDL)	
At admission	At discharge	At admission	At discharge	At admission	At discharge	At admission	At discharge	At admission	At discharge	At admission	At discharge	At admission	At discharge	At admission	At discharge	At admission	At discharge	At admission	At discharge	At admission	At discharge	At admission	At discharge	At admission	At discharge
0.47	na	43/52	na	98	na	7	na	4.35	na	1.2	na	36	28	1.2	0.77	139/3.4/100	142/4.2/99	na	na	na	na	na	na	na	na
1.38	1.52	72/27	67/34	179	101	8.2	6.7	2.28	2.3	2.09	1.5	15	29	0.74	0.76	134/4.2/101	139/3.52/101	na	na	na	na	na	na	na	na
0.14	na	51/29	na	80	na	8.1	na	4.98	na	1.05	na	56	48	1.82	0.96	113/5.61/75	136/4.2/99	na	na	na	na	na	na	na	na
0.22	na	98/53	na	101	na	6.86	na	3.03	na	0.99	na	51	65	1.43	1.32	137/3.6/95	136/4.47/97	na	na	na	na	na	na	na	na
0.15	na	24/12	na	106	na	7.3	na	4.28	na	1.02	na	27	43	0.6	0.45	144/3.62/101	138/4.36/99	na	na	na	na	na	na	na	na
0.17	na	30/46	na	119	na	7.7	na	4.42	na	1	na	32	na	1.12	0.98	141/4.03/104	na	na	na	na	na	na	na	na	na
0.43	na	25/18	na	105	na	6.7	na	3.8	na	1.13	na	22	18	0.68	0.55	137/3.7/101	139/4.1/99	na	na	na	na	na	na	na	na
0.14	na	56/129	na	140	na	7.2	na	4.39	na	0.93	na	20	16	0.91	0.58	136/4.32/97	135/4.12/99	231	na	153	na	51	na	161	na
0.12	na	19/26	na	59	na	6.6	na	3.71	na	0.95	na	19	28	0.68	0.76	137/4.13/103	136/3.89/98	na	na	na	na	na	na	na	na
0.66	na	28/36	na	73	na	7	na	4.14	na	1.05	na	27	48	0.88	0.99	137/3.92/98	142/4.02/101	na	na	na	na	na	na	na	na
0.12	na	60/32	na	176	na	7.3	na	3.1	na	1.09	na	48	79	1.63	2.75	135/3.45/102	138/4.94/103	na	na	na	na	na	na	na	na
0.5	na	28/21	na	100	na	7.6	na	4.48	na	0.97	na	36	24	0.83	0.65	137/4.41/99	136/4.06/98	na	na	na	na	na	na	na	na
0.06	na	30/16	na	66	na	6.9	na	3.75	na	0.96	na	48	36	0.94	0.74	138/5.11/103	135/4.56/100	na	na	na	na	na	na	na	na
0.12	na	17/8	na	106	na	5.9	na	2.82	na	1.06	na	80	72	4.99	4.01	136/4.55/105	135/4.28/99	na	na	na	na	na	na	na	na
0.23	na	75/96	na	47	na	7.8	na	4.43	na	1.05	na	27	45	0.9	0.83	142/3.93/98	141/3.99/101	na	na	na	na	na	na	na	na
0.15	na	35/42	na	82	na	6.5	na	4.21	na	1.05	na	62	28	1.79	0.82	134/3.52/92	138/4.56/98	na	na	na	na	na	na	na	na
0.18	na	26/42	na	96	na	7.5	na	4.16	na	0.98	na	35	24	0.86	0.71	135/4.23/101	139/4.86/100	na	na	na	na	na	na	na	na
0.14	na	28/32	na	101	na	6.9	na	3.82	na	1.04	na	23	25	0.37	0.3	148/3.44/104	121/5.34/86	na	na	na	na	na	na	na	na
0.19	na	35/66	na	110	na	5.8	na	2.26	na	1.28	na	95	118	3.58	3.96	144/4.58/101	141/4.89/102	na	na	na	na	na	na	na	na
0.04	na	37/21	na	70	na	7.9	na	4.11	na	1.04	na	27	28	1.39	0.72	136/4.21/103	138/4.32/99	na	na	na	na	na	na	na	na
0.12	na	24/38	na	95	na	7.8	na	4.17	na	1.02	na	44	21	1.34	0.54	145/4.46/111	138/4.25/100	na	na	na	na	na	na	na	na

ICH score at presentation							CT angio with venous cuts	MRI angio with venous cuts	2D ECHO	surgery	Surgical intervention	Morbidity outcome at discharge Using Modified Rankin Scale (mRS)	FOLLOW UP	
Age >= 80 years	Glasgow coma scale (GCS) at presentation	Volume of hematoma on baseline CT scan of brain by ABC/2 formula		Location of hematoma (infratentorial or supratentorial)	Presence of intraventricular extension	Total Score							At 30 days using Modified Rankin Scale (mRS)	At 60 days using Modified Rankin Scale (mRS)
			ICH volume	Infratentorial origin										
no (score 0)	gcs: 9 (score 1)	0	score 0	yes (score 1)	yes (score 1)	3	not done	not done	na	no	no	score 5	score 4	score 4
no (score 0)	gcs: 8 (score 1)	1	score 1	no (score 0)	yes (score 1)	3	not done	not done	normal lv function with ef 60%	no	no	score 4	score 4	score 4
no (score 0)	gcs: 9 (score 1)	0	3.211 cm3 (score 0)	yes (score 1)	no (score 0)	2	not done	normal	conc lvh with ef 60%	no	no	score 4	score 4	score 3
no (score 0)	gcs: 10 (score 1)	1	31.464 cm3 (score 1)	no (score 0)	yes (score 1)	3	not done	not done	na	no	no	score 4	score 4	score 4
no(score 0)	gcs: 15 (score 0)	0	29.406 cm3 (score 0)	yes (score 1)	no (score 0)	1	not done	normal	na	no	no	score 3	score 3	score 2
no (score 0)	gcs: 15 (score 0)	0	5.508 cm3 (score 0)	no (score 0)	no (score 0)	0	not done	not done	na	no	no	score 3	score 2	score 1
no (score 0)	gcs: 15 (score 0)	0	1.296 cm3 (score 0)	no (score 0)	no (score 0)	0	not done	not done	conc lvh with ef 60%	no	no	score 2	score 1	score 0
no (score 0)	gcs: 11 (score 1)	0	23.529 cm3 (score 0)	no (score 0)	no (score 0)	1	not done	not done	bicuspid valve, conc lvh with ef 55%	no	no	score 4	score 4	score 4
no (score 0)	gcs: 9 (score 1)	0	24.531 cm3 (score 0)	no (score 0)	yes (score 1)	2	not done	not done	conc lvh with ef 60%	no	no	score 4	score 4	score4
no (score 0)	gcs: 4 (score 2)	1	102.6 cm3 (score 1)	no (score 0)	yes (score 1)	4	not done	not done	severe as with conc lvh with ef 60%	yes	yes	score 5	score 6	
no (score 0)	gcs: 3 (score 2)	1	33.75 cm3 (score 1)	yes (score 1)	yes (score 1)	5	not done	not done	ghk with ef 44-46%	no	no	score 5	score 6	
no (score 0)	gcs: 15 (score 0)	0	score 0	no (score 0)	no (score 0)	0	not done	not done	ghk with ef 40% with type ii dd	no	no	score 3	score 3	score 2
yes (score 1)	gcs: 12 (score 1)	0	10.78 cm3 (score 0)	yes (score 1)	yes (score 1)	4	not done	not done	na	no	no	score 4	score 4	score 4
no (score 0)	gcs: 12 (score 1)	0	3.96 cm3	no (score 0)	yes (score 1)	2	not done	not done	ghk with ef 35%	no	no	score 4	score 4	score 4
no (score 0)	gcs: 11 (score 1)	1	36.613 cm3 (score 1)	no (score 0)	yes (score 1)	3	not done	not done	na	no	no	score 4	score 4	score 4
no (score 0)	gcs: 11 (score 1)	0	10.5 cm3 (score 0)	no (score 0)	yes (score 1)	2	not done	not done	na	no	no	score 4	score 4	score 4
no (score 0)	gcs: 10 (score 1)	0	score 0	no (score 0)	yes (score 1)	2	not done	not done	na	no	no	score 4	score 4	score 4
yes (score 1)	gcs: 9 (score 1)	1	42.772 cm3 (score 1)	no (score 0)	yes (score 1)	4	not done	not done	conc lvh with ef 60% with type I dd	no	surgery advised but refused	score 6		
no (score 0)	gcs: 4 (score 2)	1	score 1	no (score 0)	yes (score 1)	4	not done	not done	conc lvh with ef 60%	no	no	score 5	score 6	
no (score 0)	gcs: 13 (score 0)	0	14.72 cm3 (score 0)	no (score 0)	no (score 0)	0	not done	not done	conc lvh with ghk with ef 44%	no	no	score 4	score 4	score 3
no (score 0)	gcs: 9 (score 1)	0	6.93 cm3 (score 0)	yes (score 1)	yes (score 1)	3	not done	not done	na	yes	yes- post evd insertion	score 4	score 4	score 4

Sr. No	MRD No	Name	Age	Gender	Admn No	Outcome of the patient	Site of bleed (gangliocapsular-1, Thalamic - 2 , cerebellum - 3, Pontine/brainstem - 4 , cortical/atypical - 5)	Side of bleed			IVH yes/NO	Hydrocephalus	coagulopathy	Outcome diagnosis	Length of stay (In Days)		CNS Symptoms								
																	ALTERED SENSORIUM	WEAKNESS							
																		MONOPARESİS		MONOPLEGIA		HEMIPARESIS		HEMIPLEGIA	
								RIGHT	LEFT	B/l					In Ward	In ICU		RT	LT	RT	LT	RT	LT	RT	LT
62	1162717	RD	45	Female	2021044865	Dor	1		yes		yes			htn with acc htn with left gc bleed with left umn facial nerve palsy with ivh	7	8	drowsy (came intubated from outside)							yes	
63	1162674	US	56	Male	2021044829	Dama	1 and 2		yes		yes			htn with ckd with old cva with cad post ptca (on dual antiplatelets) with left thalmocapsular and b/l temporo-occipital ich with ivh			sudden onset loc few hrs pta							yes	
64	928682	V	50	Female	2020027411	Discharged	1		yes					htn with acute cva- (right complete hemiplegia- left gangliocapsular bleed)	5		NO							yes	
65	924353	KK	71	Male	2020028121	Discharged	1 and 2		yes		yes			dm type ii with htn with ba with acute cva- right hemiplegia with left thalmocapsular bleed with ivh	5	7	drowsy- insidious onset progressive since 2 days pta							yes	
66	926315	BS	45	Male	2020025958	Discharged	1		yes		yes			htn with right hemiparesis with left gc bleed with ivh	9	10	sudden onset loc few hrs pta					yes			
67	925536	RK	56	Male	2020025462	Dama	1 and 2	yes			yes			htn with right thalmocapsular bleed with ivh with mass effect-post right decompressive ftp craniotomy with ich evacuation with lax duroplasty under ga on 07/05/2020	12	10	unconscious few hrs pta								yes
68	926738	SM	32	Male	2020026262	Dama	1		yes		yes			htn with left gc ich with ivh		1	sudden onset loc since 1hr pta							yes	
69	930541	SG	72	Male	2020028561	Discharged	1 and 2		yes		no			type ii dm with htn with ckd with ich- left thalmocapsular bleed with left umn facial nerve palsy	5		NO					yes			
70	925975	BD	68	Female	2020025763	Discharged	2		yes		yes	present		htn with left thalamic ich with ivh with hydrocephalus with post evd insertion on 10.05.2020	9	16	unconscious since 1 day pta							yes	
71	927745	GS	42	Male	2020026894	Dama	1		yes		yes			htn with left gc bleed with ivh with mass effect with post left ftp decompressive craniotomy with evacuation of ich with lax duroplasty	9	33	unconscious since 1 day pta							yes	
72	931276	SPS	59	Male	2020028926	Dama	1 and 2	yes			yes	present		type ii dm with htn with acc htn with right thalmocapsular bleed with mass effect with ivh with post right evd insertion on 03/06/2020 with right umn facial nerve palsy		2	unconscious few hrs pta								yes
73	933779	MS	50	Male	2020030164	Dama	1		yes		yes			htn with ckd with left gc bleed with ivh with mass effect		1	sudden loc since 12 hrs pta							yes	
74	935301	GK	45	Female	2020030974	death	5		yes		yes			Large left temporoparietal ich with mass effect with cortical vein thrombosis with left ftp decompression craniotomy under		6	drowsy since 1 day pta							yes	
75	936110	AR	47	Female	2020031415	Dama	1	yes						htn with right gc bleed		1	sudden onset loc since 5hrs pta								yes
76	937683	SS	55	Male	2020032248	Dor	5	yes						acute cva- left hemiplegia- right parietooccipital ich with right decompression craniotomy with ich evacuation on 26.06.2020	4	11	drowsy few hrs pta								yes
77	938748	JS	66	Male	2020032805	Discharged	1 and 2	yes			yes	present		htn with acc htn with acute cva- left hemiplegia with right thalmocapsular bleed with ivh with obstructive hydrochephalus with right umn facial nerve palsy with right ftp decompression craniotomy with ich evacuation with lax	14	16	sudden onset loc few hrs pta								yes
78	996862	K	17	Male	2020058803	Dama	5	yes			yes			right fronto-temporal parietal ich with ivh with diffuse cerebral and cerebellar edema		1	sudden onset loc few hrs pta								yes
79	998569	HK	65	Female	2020059523	Discharged	3	yes			yes			htn with right cerebellar bleed with ivh with mass effect with hcv reactive with cld with post right cerebellar ich evacuation and evd insertion under ga on 12/12/2020	4	10	drowsy since few hrs pta							yes	
80	998577	PK	50	Female	2020059537	Dama	5		yes					left frontal ich- secondary to av malformation		1	sudden onset loc since morning							yes	
81	1000050	US	60	Male	2020059947	Discharged	5	yes			yes			htn with cad post ptca with right parieto-occipital bleed with mass effect with post right parieto-occipital craniotomy with evacuation of ich under ga on 15.12.2020 with right umn facial nerve palsy	9	8	drowsy since 1 day pta								yes
82	1003547	SS	45	Male	2020061325	Dama	5		yes		yes			large left ftp ich with ivh		1	sudden onset loc since morning								

					Comorbid disease								Personal history				DRUG HISTORY			General physical examination						
WEAKNESS	HEADACHE	VOMITING	SEIZURE	SPEECH DISTURBANCE																Sensorium	Vitals on admission					
					Diabetes mellitus	Dm	HTN	HTN	CAD	CAD	CKD	CLD	Vegetarian/Non veg	Smoker/Non smoker	Alcoholic/Non alcoholic		Anticoagulants	Antiplatelets	Antiplatelets		Pulse	SBP	DBP	MAP	RR	Temp
sudden onset right sided hemiplegia since 1 day pta	No	No	NO	yes	NO	no	yes	no	no	NO	NO	NO	veg	no	no		no	no	no	drowsy but arousable	90	180	90	120	20	98.4
No	yes	yes	NO	no	NO	no	yes (on ir	yes (on irregular t/t)	yes	yes	yes	NO	non veg	no	no		no	yes on dual antiplatelets	yes on dual antiplatelets-ecosprin 150 and clopidogrel 75mg	unconscious	56	140	80	100	24	98.4
sudden onset right sided hemiplegia since 2 hrs pta	No	No	NO	no	NO	no	yes (on ir	yes (on irregular t/t)	no	NO	NO	NO	veg	no	no		no	no	no	conscious well oriented	102	160	100	120	24	98.4
sudden onset right sided hemiplegia since 3 days pta	No	No	NO	no	yes	yes	yes	yes	no	NO	NO	NO	veg	no	yes		no	no	no	drowsy but arousable	108	180	90	120	gasping	98.4
sudden onset right sided hemiparesis since few hrs pta	No	No	NO	no	NO	no	yes	no	no	NO	NO	NO	non veg	no	yes		no	no	no	drowsy but arousable	80	150	80	103	24	98.4
sudden onset left sided hemiplegia since 1 day pta	No	yes	NO	no	NO	no	yes	yes since 15yrs	no	NO	NO	NO	veg	no	no		no	no	no	unconscious	90	200	100	133	20	98.4
No	No	yes	NO	no	NO	no	yes (on ir	yes (on irregular t/t)	no	NO	NO	NO	veg	no	no		no	no	no	drowsy but arousable	96	280	190	220	24	98.4
sudden onset right sided hemiparesis since 8hrs pta	yes	yes	NO	yes	yes	yes	yes (on ir	yes (on irregular t/t)	no	NO	yes	NO	veg	no	no		no	no	no	conscious well oriented	82	170	100	123	22	98.4
sudden onset right sided hemiplegia since 1 day pta	yes	yes	NO	no	no	no	yes (on ir	yes (on irregular t/t)	no	NO	NO	NO	veg	no	no		no	no	no	unconscious	90	180	100	127	18	98.4
sudden onset right sided hemiplegia since 1 day pta	No	No	NO	no	NO	no	yes (on ir	yes (on irregular t/t)	no	NO	NO	NO	non veg	no	yes		no	no	no	unconscious	68	140	80	100	24	98.4
sudden onset left sided hemiplegia since few hrs pta	No	No	NO	yes	yes since 30yrs	yes	yes	yes since 1.5yrs	yes	yes	NO	NO	veg	no	no		no	yes on single antiplatelet	yes on clopidogrel 75mg	unconscious	78	170	100	123	30	98.4
sudden onset right sided hemiplegia since few hrs pta	No	yes	NO	no	NO	no	yes	yes	no	NO	yes	NO	non veg	no	no		no	no	no	drowsy but arousable	109	160	100	120	22	98.4
sudden onset right sided hemiplegia since 2 days pta	yes	yes	NO	no	NO	no	no	no	no	NO	NO	NO	veg	no	no		no	no	no	drowsy but arousable	84	130	70	90	20	98.4
sudden onset left sided hemiplegia since few hrs pta	No	yes	NO	no	NO	no	yes (on ir	yes (on irregular t/t)	no	NO	NO	NO	veg	no	no		no	no	no	drowsy but arousable	62	140	80	100	22	98.4
sudden onset left sided hemiplegia since few hrs pta	No	No	NO	no	NO	no	yes	yes	no	NO	NO	NO	non veg	no	yes		no	no	no	drowsy but arousable	84	140	100	113	22	98.4
sudden onset left sided hemiplegia since few hrs pta	No	No	yes(gtcs)	yes	NO	no	yes	yes	no	NO	NO	NO	non veg	no	no		no	no	no	unconscious	92	150	90	110	20	98.4
No	yes	yes	yes	no	NO	no	no	no	no	NO	NO	NO	veg	no	no		no	no	no	unconscious	118	90	60	70	32	98.4
sudden onset right sided hemiplegia since few hrs pta	yes	yes	NO	no	yes	yes	yes	yes since 3yrs	no	NO	NO	yes	veg	no	no		no	no	no	unconscious	86	180	100	127	22	98.4
right sided hemiplegia	no	No	NO	no	NO	no	no	no	no	NO	NO	NO	veg	no	no		no	no	no	drowsy but arousable	76	150	90	110	24	98.4
sudden onset left sided hemiplegia since 1 day pta	yes	yes	NO	yes	NO	no	yes	yes	yes	yes	NO	NO	non veg	no	no		no	yes on dual antiplatelets	yes on ecosprin and clopidogrel 75+75	drowsy but arousable	120	150	90	110	16	98.4
No	No	No	NO	no	NO	no	no	no	no	NO	NO	NO	non veg	no	no		no	no	no	unconscious	90	190	90	123	24	98.4

						GCS on admission				Systemic CNS examination																	
										1. Higher mental function	2. Cranial nerves	3. Pupil												Deep tendon reflexes			
												Size		Reaction to light		Reaction to convergence		Tone (flacidity/ spasticity)		Power upper limb		Power lower limb		biceps		triceps	
Pallor	Icterus	Cyanosis	Clubbing	LAP	Edema – Pitting/not	gcs score	Eye	Verbal	Motor			Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left
NO	NO	NO	NO	NO	no	10	3	t	6	drowsy	rt umn facial nerve palsy	2.5mm	2.5mm	reactive	reactive	reactive	reactive	flaccid UL & LL	normal	0/5	5-5	0/5	5-5	Absent	Normal	Absent	Normal
yes	NO	NO	NO	NO	NO	3	1	t	1	Unconscious	normal	3.2mm	3.2mm	non reactive	Non-Reactive	Non-Reactive	Non-Reactive	flaccid UL & LL	flaccid UL & LL	0/5	0/5	0/5	0/5	Absent	Absent	Absent	Absent
yes	NO	NO	NO	NO	NO	15	4	5	6	normal	normal	2.5mm	2.5mm	reactive	reactive	reactive	reactive	flaccid UL & LL	normal	0/5	5-5	0/5	5-5	Absent	Normal	Absent	Normal
NO	NO	NO	NO	NO	NO	5	2	t	2	drowsy	normal	1.5mm	1.5mm	reactive	Non-Reactive	reactive	Non-Reactive	flaccid UL & LL	flaccid UL & LL	0/5	1-5	0/5	1-5	Absent	Absent	Absent	Absent
NO	NO	NO	NO	NO	NO	12	3	3	6	drowsy	normal	2.5mm	2.5mm	reactive	reactive	reactive	reactive	flaccid UL & LL	normal	0/5	5-5	2-5	5-5	Absent	Normal	Absent	Normal
NO	NO	NO	NO	NO	NO	4	1	1	2	Unconscious	normal	3mm	3mm	non reactive	Non-Reactive	Non-Reactive	Non-Reactive	flaccid UL & LL	flaccid UL & LL	1-5	0/5	1-5	0/5	Absent	Absent	Absent	Absent
NO	NO	NO	NO	NO	NO	8	3	t	4	drowsy	normal	2.5mm	2.5mm	reactive	reactive	reactive	reactive	flaccid UL & LL	normal	0/5	4-5	0/5	4-5	Absent	Normal	Absent	Normal
NO	NO	NO	NO	NO	NO	15	4	5	6	normal	rt umn facial nerve palsy	2.5mm	2.5mm	reactive	reactive	reactive	reactive	spastic UL & LL	normal	3-5	5-5	4-5	5-5	exagerrated	Normal	exagerrated	Normal
NO	NO	NO	NO	NO	NO	4	1	t	2	Unconscious	normal	2.5mm	2.5mm	reactive	reactive	reactive	reactive	flaccid UL & LL	normal	0/5	2-5	0/5	2-5	Absent	Normal	Absent	Normal
NO	NO	NO	NO	NO	NO	8	2	1 then t	5	Unconscious	normal	2.5mm	2.5mm	reactive	reactive	reactive	reactive	flaccid UL & LL	normal	0/5	5-5	0/5	5-5	Absent	Normal	Absent	Normal
yes	NO	NO	NO	NO	NO	3	1	t	1	Unconscious	left umn facial nerve palsy	2mm	2mm	non reactive	Non-Reactive	Non-Reactive	Non-Reactive	flaccid UL & LL	flaccid UL & LL	0/5	0/5	0/5	0/5	Absent	Absent	Absent	Absent
NO	NO	NO	NO	NO	NO	8	2	1 then t	5	drowsy	normal	2mm	2mm	non reactive	Non-Reactive	Non-Reactive	Non-Reactive	flaccid UL & LL	normal	0/5	4-5	0/5	4-5	Absent	Normal	Absent	Normal
yes	NO	NO	NO	no	NO	10	3	2	5	drowsy	normal	2mm	2mm	reactive	reactive	reactive	reactive	flaccid UL & LL	normal	0/5	5-5	0/5	5-5	Absent	Normal	Absent	Normal
NO	NO	NO	NO	NO	NO	11	2	3	6	drowsy	normal	2.5mm	2.5mm	reactive	reactive	reactive	reactive	normal	flaccid UL & LL	4-5	0/5	4-5	0/5	Normal	Absent	Normal	Absent
NO	NO	NO	NO	NO	NO	12	3	4 then t for	5	drowsy	normal	2.5mm	2.5mm	reactive	reactive	reactive	reactive	normal	flaccid UL & LL	5-5	0/5	5-5	0/5	Normal	Absent	Normal	Absent
NO	NO	NO	NO	NO	NO	6	2	2 then t	2	Unconscious	left umn facial nerve palsy	3mm	3mm	non reactive	Non-Reactive	Non-Reactive	Non-Reactive	flaccid UL & LL	flaccid UL & LL	2-5	0/5	2-5	0/5	Absent	Absent	Absent	Absent
NO	NO	NO	NO	NO	no	3	1	t	1	Unconscious	normal	3.5mm	3.5mm	non reactive	Non-Reactive	Non-Reactive	Non-Reactive	flaccid UL & LL	flaccid UL & LL	0/5	0/5	0/5	0/5	Absent	Absent	Absent	Absent
NO	NO	NO	NO	NO	NO	7	1	1 then t	5	Unconscious	normal	2.5mm	2.5mm	reactive	reactive	reactive	reactive	flaccid UL & LL	normal	0/5	5-5	0/5	5-5	Absent	Normal	Absent	Normal
NO	NO	NO	NO	NO	NO	7	2	t	4	drowsy	normal	2.5mm	2.5mm	reactive	reactive	reactive	reactive	flaccid UL & LL	normal	0/5	5-5	0/5	5-5	Absent	Normal	Absent	Normal
NO	NO	NO	NO	NO	NO	9	2	2 then t	5	drowsy	left umn facial nerve palsy	2.5mm	2.5mm	reactive	reactive	reactive	reactive	normal	flaccid UL & LL	5-5	0/5	5-5	0/5	Normal	Absent	Normal	Absent
NO	NO	NO	NO	NO	NO	3	1	t	1	Unconscious	normal	3.5mm	3.5mm	non reactive	Non-Reactive	Non-Reactive	Non-Reactive	flaccid UL & LL	flaccid UL & LL	0/5	0/5	0/5	0/5	Absent	Absent	Absent	Absent

																INVESTIGATIONS											
						superficial reflexes								5. sensory system	6. cerebellar signs	HEMOGRAM										LFT	
suppinator		knee		ankle		upper abdominal		lower abdominal		cremasteric		Plantar				TLC		HB		MCV		MCH		PLATELET		TOTAL BILIRUBIN	
Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left			At admission	At discharge	At admission	At discharge	At admission	At discharge	At admission	At discharge	At admission	At discharge	At admission	At discharge
Absent	Normal	Absent	Normal	Absent	Normal	Normal	Normal	Normal	Normal	Normal	Normal	extensor	flexor	normal	normal	9.4	12.4	11	10.8	100.2	99.6	32.9	33	103	142	1.45	na
Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	mute	mute	Can't be assesed	Can't be assesed	2.9	na	8.2	na	91.9	na	31	na	171	na	0.82	na
Absent	Normal	Absent	Normal	Absent	Normal	Normal	Normal	Normal	Normal	Normal	Normal	extensor	flexor	normal	normal	9.5	8.7	12.4	12.8	87.1	87.5	29	28.8	120	198	0.41	na
Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	extensor	extensor	Can't be assesed	Can't be assesed	14.5	9.2	13	12.4	67.4	67.2	21	20.5	180	202	0.33	na
Absent	Normal	Absent	Normal	Absent	Normal	Normal	Normal	Normal	Normal	Normal	Normal	extensor	flexor	normal	normal	10.4	6.8	17.8	15.6	83.2	83.6	28	28.4	340	425	0.48	na
Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	mute	mute	Can't be assesed	Can't be assesed	14.1	10.5	16.7	14.9	76.2	76	24.9	24.6	350	268	0.68	na
Absent	Normal	Absent	Normal	Absent	Normal	Normal	Normal	Normal	Normal	Normal	Normal	extensor	flexor	normal	normal	11.5	9.7	12.8	12.6	87.3	87.2	27.7	27.4	206	185	0.31	na
exagerrated	Normal	exagerrated	Normal	exagerrated	Normal	Absent	Absent	Absent	Absent	Absent	Absent	extensor	flexor	normal	normal	7.5	6.8	13.2	13.1	85.5	85.6	28.3	28.1	204	298	0.45	na
Absent	Normal	Absent	Normal	Absent	Normal	Normal	Normal	Normal	Normal	Normal	Normal	extensor	mute	Can't be assesed	Can't be assesed	15.7	10.5	13.5	11.8	89.9	89.4	28.9	28.6	206	180	0.52	na
Absent	Normal	Absent	Normal	Absent	Normal	Normal	Normal	Normal	Normal	Normal	Normal	extensor	flexor	normal	normal	10.3	16.8	14.9	11.5	87.7	86.5	29.7	29.1	225	140	1.08	1.22
Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	mute	mute	Can't be assesed	Can't be assesed	9.3	8.2	10.6	8.9	89.3	88.4	28.5	28.1	82	75	0.23	na
Absent	Normal	Absent	Normal	Absent	Normal	Normal	Normal	Normal	Normal	Normal	Normal	extensor	mute	normal	normal	11.2	14.3	12.2	11.6	105	104.8	34.1	33.7	130	110	1.5	na
Absent	Normal	Absent	Normal	Absent	Normal	Normal	Normal	Normal	Normal	Normal	Normal	extensor	flexor	normal	normal	4.2	12.7	2.2	8.1	84.4	72.2	23.1	21.6	150	145	1.6	na
Normal	Absent	Normal	Absent	Normal	Absent	Normal	Normal	Normal	Normal	Normal	Normal	flexor	extensor	normal	normal	11.4	na	12.5	na	84.4	na	27.7	na	155	na	0.29	na
Normal	Absent	Normal	Absent	Normal	Absent	Normal	Normal	Normal	Normal	Normal	Normal	flexor	extensor	normal	normal	9	12.5	12.2	12.3	85.5	87.4	27.5	27.6	232	259	0.68	na
Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	extensor	extensor	Can't be assesed	Can't be assesed	18.6	7.8	14.2	11.8	86.7	86.1	28.6	28.2	327	402	0.68	0.84
Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	mute	mute	Can't be assesed	Can't be assesed	21.1	na	12.8	na	88.1	na	27.6	na	150	na	0.74	na
Absent	Normal	Absent	Normal	Absent	Normal	Normal	Normal	Normal	Normal	Normal	Normal	extensor	flexor	normal	normal	11.9	7.4	12.9	11.6	90.6	90.1	29.2	28.4	221	264	2.58	2.65
Absent	Normal	Absent	Normal	Absent	Normal	Normal	Normal	Normal	Normal	Normal	Normal	extensor	flexor	normal	normal	19.2	na	12.9	na	93.8	na	29.5	na	140	na	0.59	na
Normal	Absent	Normal	Absent	Normal	Absent	Normal	Normal	Normal	Normal	Normal	Normal	flexor	extensor	normal	normal	21.6	8.7	17.3	15.4	88.8	88.2	28.9	28.4	258	202	0.7	na
Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	mute	mute	Can't be assesed	Can't be assesed	13.1	16.2	14.6	14.3	99.5	99.1	32.3	32	199	180	0.43	na

												RFT						Lipid profile							
DIRECT BILIRUBIN		SGOT/SGPT		ALP		TOTAL PROTEIN		SERUM ALBUMIN		PTI/ INR		BLOOD UREA		SERUM CREATININE		Serum electrolytes(		CHOLESTEROL(T)		Triglycerides		cholesterol (HDL)		cholesterol (LDL)	
At admission	At discharge	At admission	At discharge	At admission	At discharge	At admission	At discharge	At admission	At discharge	At admission	At discharge	At admission	At discharge	At admission	At discharge	At admission	At discharge	At admission	At discharge	At admission	At discharge	At admission	At discharge	At admission	At discharge
0.36	na	30/22	na	89	na	8.9	na	4.82	na	1.05	na	24	32	1.11	0.85	141/3.51/98	138/3.99/101	na	na	na	na	na	na	na	na
0.18	na	35/38	na	112	na	6.5	na	2.83	na	1.35	na	38	na	2.15	na	143/3.34/101	na	na	na	na	na	na	na	na	na
0.18	na	59/57	na	134	na	7.8	na	4.73	na	1.08	na	16	29	0.56	0.87	141/3.92/104	138/4.25/99	174	na	110	na	48	na	111	na
0.13	na	18/23	na	85	na	6.8	na	3.22	na	1.17	na	149	58	1.39	0.75	147/5.81/103	136/4.56/98	na	na	na	na	na	na	na	na
0.14	na	24/36	na	97	na	7.89	na	4.56	na	1.09	na	20	35	1.18	0.98	136/5.20/94	138/4.8/100	na	na	na	na	na	na	na	na
0.2	na	34/29	na	122	na	8.1	na	4.44	na	1	na	53	24	2.64	0.78	142/4.01/97	135/4.58/102	na	na	na	na	na	na	na	na
0.11	na	35/44	na	98	na	8.2	na	5.15	na	0.97	na	27	34	0.82	0.98	142/3.24/101	141/4.25/100	na	na	na	na	na	na	na	na
0.13	na	26/38	na	94	na	8.4	na	4.65	na	1.06	na	22	na	0.74	na	135/4.25/100	na	na	na	na	na	na	na	na	na
0.18	na	24/28	na	97	na	8.1	na	4.27	na	1.07	na	39	48	0.52	0.86	134/3.62/94	138/4.25/101	na	na	na	na	na	na	na	na
0.24	0.36	20/18	86/82	84	118	7.3	6.7	4.69	3.03	1.12	1.28	24	59	0.87	0.99	142/4.27/102	140/3.99/101	na	na	na	na	na	na	na	na
0.05	na	28/23	na	74	na	5.6	na	3.13	na	1.18	na	30	37	2.19	2.3	138/5.40/109	134/6.05/107	na	na	na	na	na	na	na	na
0.38	na	31/23	na	101	na	8.3	na	5.3	na	1.17	na	39	48	1.02	1.15	142/5.11/98	144/4.96/100	na	na	na	na	na	na	na	na
0.78	na	42/58	na	106	na	7.1	na	3.45	na	1.04	na	12	36	0.77	0.92	148/3.48/113	152/3.85/115	na	na	na	na	na	na	na	na
0.13	na	18/18	na	101	na	7.4	na	4.59	na	1.09	na	28	na	0.69	na	146/4.10/103	na	na	na	na	na	na	na	na	na
0.18	na	24/27	na	92	na	7.6	na	4.08	na	1.13	na	38	22	1.09	0.86	143/3.9/109	140/4.28/100	na	na	na	na	na	na	na	na
0.21	0.35	27/26	42/38	96	115	8	7.2	4.84	3.38	1.1	na	24	27	1.08	0.74	134/3.93/96	138/4.87/101	na	na	na	na	na	na	na	na
0.17	na	34/28	na	97	na	7.4	na	4.26	na	1.22	na	26	na	1.22	na	142/4.81/106	na	na	na	na	na	na	na	na	na
0.65	0.42	82/124	75/140	152	163	6.24	6.01	3.23	2.89	1.45	1.37	115	58	2.73	1.28	144/4.31/112	138/4.22/101	na	na	na	na	na	na	na	na
0.18	na	42/46	na	101	na	8.45	na	4.68	na	1.25	na	26	na	0.64	na	134/4.37/99	na	na	na	na	na	na	na	na	na
0.19	na	27/30	na	186	na	8.3	na	4.51	na	1.09	na	37	48	1.36	0.85	142/3.64/97	138/4.28/100	na	na	na	na	na	na	na	na
0.28	na	36/32	na	119	na	6.9	na	4.09	na	0.97	na	18	42	0.52	0.99	153/4.12/117	158/4.26/119	na	na	na	na	na	na	na	na

ICH score at presentation							CT angio with venous cuts	MRI angio with venous cuts	2D ECHO	surgery	Surgical intervention	Morbidity outcome at discharge Using Modified Rankin Scale (mRS)	FOLLOW UP	
Age >= 80 years	Glasgow coma scale (GCS) at presentation	Volume of hematoma on baseline CT scan of brain by ABC/2 formula		Location of hematoma (infratentorial or supratentorial)	Presence of intraventricular extension	Total Score							At 30 days using Modified Rankin Scale (mRS)	At 60 days using Modified Rankin Scale (mRS)
			ICH volume	Infratentorial origin										
no (score 0)	gcs: 10 (score 1)	0	9.24 cm3 (score 0)	no (score 0)	yes (score 1)	2	not done	not done	na	no	no	e4vtm6, score 5	score 5	score 4
no (score 0)	gcs: 3 (score 2)	1	score 1	yes (score 1)	yes (score 1)	5	not done	not done	na	no	no	score 5	score 6	
no (score 0)	gcs: 15 (score 0)	0	6.669 cm3 (score 0)	no (score 0)	no (score 0)	0	not done	not done	na	no	no	score 4	score 4	score 4
no (score 0)	gcs: 5 (score 1)	1	score 1	no (score 0)	yes (score 1)	3	not done	not done	na	no	no	score 5	score 5	score 4
no (score 0)	gcs: 12 (score 1)	1	40.749 cm3 (score 1)	no (score 0)	yes (score 1)	3	not done	not done	na	no	no	score 4	score 4	score 4
no (score 0)	gcs: 4 (score 2)	1	116.32 cm3 (score 1)	no (score 0)	yes (score 1)	4	not done	not done	conc lvh with ef 60%	yes	yes	e1vtm2, score 5	score 5	score5
no (score 0)	gcs: 8 (score 1)	1	69.905 cm3 (score 1)	no (score 0)	yes (score 1)	3	normal	not done	na	no	surgery advised but refused	score 5	score 4	score 4
no (score 0)	gcs: 15 (score 0)	0	2.244 cm3 (score 0)	no (score 0)	no (score 0)	0	not done	not done	na	no	no	score 4	score 4	score 3
no (score 0)	gcs: 4 (score 2)	1	score 1	no (score 0)	yes (score 1)	4	not done	not done	na	yes	yes- post evd insertion on 10.05.2020	e4v2m6, score 5	score 4	score 4
no (score 0)	gcs: 8 (score 1)	1	48.825 cm 3 (score 1)	no (score 0)	yes (score 1)	3	not done	not done	conc lvh with ef 60%	yes	yes	e2v1m5, score 5	score 5	score 4
no (score 0)	gcs: 3 (score 2)	0	18.73 cm3 (score 0)	no (score 0)	yes (score 1)	3	not done	not done	na	yes	yes- post evd insertion	score 5	score 6	
no (score 0)	gcs: 8 (score 1)	1	61.425 cm3 (score 1)	no (score 0)	yes (score 1)	3	not done	not done	na	no	surgery advised but refused	e2vt m4-5, score 5	score 6	
no (score 0)	gcs: 10 (score 1)	1	score 1	yes (score 1)	yes (score 1)	4	cortical venous	not done	na	yes	yes	score 6		
no (score 0)	gcs: 11 (score 1)	0	11.43 cm3 (score 0)	no (score 0)	no (score 0)	1	not done	not done	na	no	no	score 5	score 4	score 4
no (score 0)	gcs: 12 (score 1)	1	35.7 cm3 (score 1)	yes (score 1)	no (score 0)	3	not done	not done	conc lvh with ef 60%	yes	yes	score 4	score 4	score 4
no (score 0)	gcs: 6 (score 1)	1	47.43 cm3 (score 1)	no (score 0)	yes (score 1)	3	not done	not done	conc lvh with ef 60%	yes	yes	score 4	score 4	score 4
no (score 0)	gcs: 3 (score 2)	1	32 cm3 (score 1)	yes (score 1)	yes (score 1)	5	not done	not done	na	no	no	score 5	score 6	
no (score 0)	gcs: 7 (score 1)	0	9.69 cm3 (score 0)	yes (score 1)	yes (score 1)	3	not done	not done	conc lvh with ef 55%	yes	yes	score 4	score 4	score 4
no (score 0)	gcs: 7 (score 1)	0	10.56 cm3 (score 0)	no (score 0)	no (score 0)	1	av malformatio	not done	na	no	surgery advised but refused	score 5	score 6	
no (score 0)	gcs: 9 (score 1)	1	45 cm3 (score 1)	yes (score 1)	yes (score 1)	4	normal	not done	sclerotic aortic valve conc lvh with ef 60%	yes	yes	score 4	score 4	score 4
no (score 0)	gcs: 3 (score 2)	1	162.18 cm3 (score 1)	no (score 0)	yes (score 1)	4	not done	not done	na	no	no	score 5	score 6	

Sr. No	MRD No	Name	Age	Gender	Admn No	Outcome of the patient	Site of bleed (gangliocapsular-1, Thalamic - 2 , cerebellum - 3, Pontine/brainstem - 4 , cortical/atypical - 5)	Side of bleed			IVH yes/NO	Hydrocephalus	coagulopathy	Outcome diagnosis	Length of stay (In Days)		CNS Symptoms								
																	ALTERED SENSORIUM	WEAKNESS							
																		MONOPARESİS		MONOPLEGIA		HEMIPARESIS		HEMIPLEGIA	
								RIGHT	LEFT	B/l					In Ward	In ICU		RT	LT	RT	LT	RT	LT	RT	LT
83	993760	HS	30	Male	2020057492	Discharged	5		yes		yes			left frontal ich with aneurysm with cld (steatosis s3 and fibrosis f4)	11	9	NO							yes	
84	1003499	KS	86	Male	2020061314	Dama	5	yes			yes			htn with acc htn with right large ftp ich with mass effect with ivh		1	sudden loc since 5hrs pta								
85	1015868	JS	36	Male	2021003656	Dor	5	yes			yes			acute cva- left hemiplegia- right parieto-temporal ich with ivh with mca aneurysm with mass effect with post right ftp decompression craniotomy with lax duroplasty under ga on 25.01.2021 with right mca aneurysm coiling on 10.02.2021 under ga	14	11	sudden onset loc few hrs pta						yes		
86	1023371	SD	45	Female	2021006561	Discharged	1		yes		yes			htn with hhd with htn nephrosclerosis with left gangliocapsular bleed with mass effect with obsrtuctive uropathy secondary to right distal ureteric calculus with right hun with post pcn with brocas aphasia	7	9	drowsy since morning					yes			
87	1024032	HK	35	Female	2021006795	Dama	5		yes		yes	present		left frontal ich with ivh with hydrochephalus with ruptured saccular aneurysm (b/l supraclinoid ica) with post evd insertion on 07.02.2021		6	sudden onset loc 2 days back pta								
88	991908	VJ	70	Male	2021006965	Dor	1 and 2	yes			yes	present		Type ii diabetes mellitus with htn with cad post ptca with left hemiplegia with right gc bleed with ivh	9	26	drowsy since 1 day pta								yes
89	1026559	CPS	65	Male	2021007665	Discharged	1		yes					htn with acc htn with acute cva right hemiparesis- left gc bleed with left umn facial nerve palsy	14		NO					yes			
90	1043540	CLS	99	Male	2021012331	Dama	1	yes			yes			right gc ich with ivh with pacemaker in situ (2012)		1	sudden onset loc few hrs pta								
91	1051577	NK	40	Male	2021013842	Dama	1	yes			yes			Type ii dm with htn with right gc bleed with ivh		1	drowsy few hrs pta								yes
92	1063817	AR	50	Female	2021015973	Dor	5	yes			yes			recently detected type ii dm with htn with right parieto-temporal ich with mass effect with post right temporal craniotomy with evacuation of of ich on 25.03.2021	3	8	sudden onset loc few hrs pta								yes
93	1068400	MS	58	Male	2021016782	Discharged	5		yes		yes			htn with left parieto-occipital bleed with ivh	7		drowsy few hrs pta							yes	
94	1069978	GS	60	Male	2021017106	Discharged	3		yes		yes			htn with acute cva- left cerebellar bleed (vermis) with hcv and alcohol related cld with portal hypertension with ascites	7		NO								yes
95	1036422	SN	73	Male	2021017355	Discharged	3		yes					type ii dm with htn with left cerebellar ich	7		NO								
96	1009763	KS	65	Male	2021001138	Discharged	3		yes					htn with left cerebellar vermis bleed	4		NO								
97	1010369	SK	48	Male	2021001389	Discharged	1		yes		yes			htn with left gc bleed with mass effect with mls with brocas aphasia	8	6	drowsy few hrs pta							yes	
98	1012781	GS	60	Male	2021002400	Dama	1,2 and 4	yes			yes			htn with right gangliothalamic and brainstem bleed with ivh		1	sudden onset loc since morning								
99	1019553	HB	57	Female	2021005103	Discharged	5	yes			yes			right temporal lobe ich with ivh	7		no								
100	460171	JR	77	Male	2021005387	Dama	1 and 2	yes			yes			type ii dm with htn with acc htn with cad post ptca with right gc and thalamic bleed with ivh		2	sudden onset loc since few hrs pta								

					Comorbid disease								Personal history				DRUG HISTORY			General physical examination						
WEAKNESS	HEADACHE	VOMITING	SEIZURE	SPEECH DISTURBANCE																Sensorium	Vitals on admission					
					Diabetes mellitus	Dm	HTN	HTN	CAD	CAD	CKD	CLD	Vegetarian/Non veg	Smoker/Non smoker	Alcoholic/Non alcoholic		Anticoagulants	Antiplatelets	Antiplatelets		Pulse	SBP	DBP	MAP	RR	Temp
sudden onset right sided hemiplegia since few hrs pta	yes	yes	yes(gtcs)	no	NO	no	no	no	no	NO	NO	yes	non veg	no	yes		no	no	no	conscious well oriented	112	130	70	90	22	98.4
No	No	No	NO	no	NO	no	yes	yes since 20yrs	no	NO	yes	NO	veg	no	no		no	no	no	unconscious	80	140	80	100	22	98.4
sudden onset left sided hemiparesis since few hrs pta	No	yes	NO	no	NO	no	no	no	no	NO	NO	NO	non veg	no	no		no	no	no	drowsy but arousable	60	120	80	93	24	98.4
sudden onset right sided hemipresis since 4hrs pta	No	No	NO	broca's aphasia	NO	no	yes	yes	no	NO	yes	NO	veg	no	no		no	no	no	drowsy but arousable	86	190	100	130	18	98.4
No	No	No	yes(gtcs)	no	NO	no	no	no	no	NO	NO	NO	veg	no	no		no	no	no	unconscious	100	160	100	120	20	98.4
sudden onset left sided hemiplegia since 1 day pta	No	No	NO	no	yes	yes	yes	yes	yes	cad post ptca	NO	NO	veg	no	no		no	yes on single antiplatelet	yes on ecosprin 75mg	drowsy but arousable	88	140	80	100	20	98.4
sudden onset right sided hemiparesis 1/2 hr pta	No	No	NO	yes	NO	no	yes	yes	no	NO	NO	NO	veg	no	no		no	no	no	conscious well oriented	98	170	90	117	26	98.4
No	No	No	NO	no	NO	no	yes	yes	yes	cad post pacemaker	NO	NO	veg	no	no		no	no	no	unconscious	124	90	50	63	28	98.4
sudden onset left sided hemiplegia since 1 day pta	No	No	NO	no	yes	yes	yes	yes	no	NO	NO	NO	non veg	no	no		no	no	no	drowsy but arousable	100	180	100	127	24	98.4
sudden onset left sided hemiplegia since 1 day pta	yes	No	NO	no	NO	no	yes	yes	no	NO	NO	NO	veg	no	no		no	no	no	drowsy but arousable	68	140	100	113	16	98.4
sudden onset right sided hemiplegia since few hrs pta	yes	yes	yes(gtcs)	no	NO	no	yes (on ir	yes (on irregular t/t)	no	NO	NO	NO	non veg	no	no		no	no	no	drowsy but arousable	76	160	90	113	20	98.4
No	yes	yes	NO	no	NO	no	yes	yes	no	NO	NO	yes	non veg	no	yes		no	no	no	conscious well oriented	60	160	90	113	24	98.4
No	No	yes	NO	no	yes since 1 month	yes	yes	yes	no	NO	NO	NO	veg	no	no		no	no	no	conscious well oriented	110	190	100	130	22	98.4
No	No	yes	NO	no	NO	no	yes	yes since 7yrs (on regular t/t)	no	NO	NO	NO	non veg	no	no		no	no	no	conscious well oriented	96	180	110	133	24	98.4
sudden onset right sided hemiplegia since 1 day pta	No	yes	NO	broca's aphasia	NO	no	yes	yes since 10yrs	no	NO	NO	NO	veg	no	no		no	no	no	drowsy but arousable	84	200	110	140	20	98.4
No	No	No	NO	no	NO	no	yes	yes	no	NO	NO	NO	non veg	no	no		no	no	no	unconscious	64	230	110	150	28	98.4
No	yes	yes	No	no	NO	no	no	no	no	NO	NO	NO	veg	no	no		no	no	no	conscious well	96	180	90	120	24	98.4
No	No	yes	NO	no	yes	yes	yes	yes	yes	cad post ptca	NO	NO	veg	no	no		no	yes on single antiplatelet	yes on ecosprin 75mg	unconscious	88	200	100	133	32	98.4

						GCS on admission				Systemic CNS examination																	
										1. Higher mental function	2. Cranial nerves	3. Pupil												Deep tendon reflexes			
												Size		Reaction to light		Reaction to convergence		Tone (flacidity/ spasticity)		Power upper limb		Power lower limb		biceps		triceps	
Pallor	Icterus	Cyanosis	Clubbing	LAP	Edema – Pitting/not	gcs score	Eye	Verbal	Motor			Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left
NO	NO	NO	NO	NO	NO	9	3	2	4	normal	normal	2.5mm	2.5mm	reactive	reactive	reactive	reactive	spastic UL & LL	normal	0/5	5-5	0/5	5-5	exagerrated	Normal	exagerrated	Normal
NO	NO	NO	NO	NO	NO	3	1	t	1	Unconscious	normal	3.5mm	3.5mm	non reactive	Non-Reactive	Non-Reactive	Non-Reactive	flaccid UL & LL	flaccid UL & LL	0/5	0/5	0/5	0/5	Absent	Absent	Absent	Absent
NO	NO	NO	NO	NO	NO	13	3	4	6	drowsy	normal	2.5mm	2.5mm	reactive	reactive	reactive	reactive	normal	spastic UL & LL	5-5	2-5	5-5	3-5	Normal	exagerrated	Normal	exagerrated
yes	NO	NO	NO	NO	NO	10	3	1	6	drowsy	normal	2.5mm	2.5mm	reactive	reactive	reactive	reactive	flaccid UL & LL	normal	1-5	5-5	1-5	5-5	Absent	Normal	Absent	Normal
NO	NO	NO	NO	NO	NO	4	1	t	2	Unconscious	normal	2.5mm	2.5mm	sluggishly reacting	sluggishly reacting	sluggishly reacting	sluggishly reacting	flaccid UL & LL	flaccid UL & LL	0/5	0/5	0/5	0/5	Absent	Absent	Absent	Absent
NO	NO	NO	NO	NO	NO	10	3	2	5	drowsy	normal	2.5mm	2.5mm	reactive	reactive	reactive	reactive	normal	flaccid UL & LL	4-5	0/5	4-5	0/5	Normal	Absent	Normal	Absent
NO	NO	NO	NO	NO	NO	15	4	5	6	normal	rt umn facial nerve palsy	2.5mm	2.5mm	reactive	reactive	reactive	reactive	spastic UL & LL	normal	2-5	5-5	2-5	5-5	exagerrated	normal	exagerrated	normal
yes	NO	NO	NO	NO	NO	3	1	t	1	Unconscious	normal	3.5mm	3.5mm	non reactive	Non-Reactive	Non-Reactive	Non-Reactive	flaccid UL & LL	flaccid UL & LL	0/5	0/5	0/5	0/5	Absent	Absent	Absent	Absent
NO	NO	NO	NO	NO	NO	8	2	1	5	drowsy	normal	2.5mm	2.5mm	reactive	reactive	reactive	reactive	normal	flaccid UL & LL	5-5	0/5	5-5	0/5	Normal	Absent	Normal	Absent
NO	NO	NO	NO	NO	NO	11	2	4	5	drowsy	normal	2.5mm	2.5mm	reactive	reactive	reactive	reactive	normal	flaccid UL & LL	5-5	0/5	5-5	0/5	Normal	Absent	Normal	Absent
NO	NO	NO	NO	NO	NO	12	3	4	5	drowsy	normal	2.5mm	2.5mm	reactive	reactive	reactive	reactive	spastic UL & LL	normal	0/5	5-5	0/5	5-5	exagerrated	Normal	exagerrated	Normal
NO	NO	NO	NO	NO	yes	12	3	4	5	normal	normal	3mm	3mm	reactive	reactive	reactive	reactive	normal	normal	5-5	5-5	5-5	5-5	Normal	Normal	Normal	Normal
NO	NO	NO	NO	NO	NO	15	4	5	6	normal	normal	2.5mm	2.5mm	reactive	reactive	reactive	reactive	normal	normal	5-5	5-5	5-5	5-5	Normal	Normal	Normal	Normal
NO	NO	NO	NO	NO	NO	15	4	5	6	normal	normal	2.5mm	2.5mm	reactive	reactive	reactive	reactive	normal	normal	5-5	5-5	5-5	5-5	Normal	Normal	Normal	Normal
NO	NO	NO	NO	NO	NO	9	3	1	5	drowsy	normal	3mm	3mm	reactive	reactive	reactive	reactive	flaccid UL & LL	normal	0/5	5-5	0/5	5-5	Absent	Normal	Absent	Normal
NO	NO	NO	NO	NO	NO	3	1	t	1	Unconscious	normal	3.5mm	3.5mm	non reactive	Non-Reactive	Non-Reactive	Non-Reactive	flaccid UL & LL	flaccid UL & LL	0/5	0/5	0/5	0/5	Absent	Absent	Absent	Absent
NO	NO	NO	NO	NO	NO	15	4	5	6	normal	normal	2.5mm	2.5mm	reactive	reactive	reactive	reactive	normal	normal	5-5	5-5	5-5	5-5	Normal	Normal	Normal	Normal
NO	NO	NO	NO	NO	NO	3	1	t	1	Unconscious	normal	3mm	3mm	non reactive	Non-Reactive	Non-Reactive	Non-Reactive	flaccid UL & LL	flaccid UL & LL	0/5	0/5	0/5	0/5	Absent	Absent	Absent	Absent

diplegic: 19
normal: 11

																INVESTIGATIONS											
						superficial reflexes								5. sensory system	6. cerebellar signs	HEMOGRAM										LFT	
suppinator		knee		ankle		upper abdominal		lower abdominal		cremasteric		Plantar				TLC		HB		MCV		MCH		PLATELET		TOTAL BILIRUBIN	
Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left			At admission	At discharge	At admission	At discharge	At admission	At discharge	At admission	At discharge	At admission	At discharge	At admission	At discharge
exagerrated	Normal	exagerrated	Normal	exagerrated	Normal	Absent	Absent	Absent	Absent	Absent	Absent	extensor	flexor	normal	normal	6.7	11.2	6.6	10.1	93.7	93.5	29.9	29.6	59	198	0.44	na
Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	mute	mute	Can't be assesed	Can't be assesed	18.4	na	12.6	na	91.8	na	30	na	143	na	0.58	na
Normal	exagerrated	Normal	exagerrated	Normal	exagerrated	Absent	Absent	Absent	Absent	Absent	Absent	flexor	extensor	normal	normal	12.8	7.9	13.9	12.4	75.8	75.2	24.5	24.1	277	210	0.68	na
Absent	Normal	Absent	Normal	Absent	Normal	Normal	Normal	Normal	Normal	Normal	Normal	extensor	flexor	normal	normal	8.5	6.2	10.3	8.9	107.6	106.5	35	34.7	140	189	0.82	na
Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	mute	mute	Can't be assesed	Can't be assesed	12.4	16.8	11.6	10.9	92.3	91.8	29.5	29.1	167	110	0.75	na
Normal	Absent	Normal	Absent	Normal	Absent	Normal	Normal	Normal	Normal	Normal	Normal	flexor	extensor	normal	normal	42.7	13.1	11.9	10.6	83.7	86.4	27.3	27.7	421	380	2.76	0.3
exagerrated	normal	exagerrated	normal	exagerrated	normal	absent	Normal	absent	Normal	absent	Normal	extensor	flexor	normal	normal	8.8	6.7	14.5	13.8	97.4	97.8	31.5	31.9	275	302	0.36	na
Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	mute	mute	Can't be assesed	Can't be assesed	14.8	na	9.7	na	76.2	na	23.8	na	186	na	0.48	na
Normal	Absent	Normal	Absent	Normal	Absent	Normal	Normal	Normal	Normal	Normal	Normal	flexor	extensor	normal	normal	15.9	na	11	na	74.5	na	22.4	na	244	na	0.37	na
Normal	Absent	Normal	Absent	Normal	Absent	Normal	Normal	Normal	Normal	Normal	Normal	flexor	extensor	normal	normal	16.7	12.2	13.3	12.2	82.4	84.6	25.9	25.7	204	167	0.45	na
exagerrated	Normal	exagerrated	Normal	exagerrated	Normal	absent	normal	absent	normal	absent	normal	extensor	flexor	normal	normal	15.3	8.7	14.1	13.8	91.6	91.2	29.9	29.5	264	302	0.9	na
Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	flexor	flexor	normal	present	4.7	na	12.7	na	92.2	na	31	na	60	80	1.06	na
Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	flexor	flexor	normal	present	15.9	8.4	13.7	13.2	89.6	89.1	29.6	29.5	238	252	0.46	na
Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	flexor	flexor	normal	present	11.1	6.8	15.9	15.4	87.2	87.6	29.2	29.8	247	321	0.59	na
Absent	Normal	Absent	Normal	Absent	Normal	Normal	Normal	Normal	Normal	Normal	Normal	extensor	flexor	normal	normal	18.7	5.8	13.1	12.7	82.4	82.9	26.1	26.7	307	658	0.49	na
Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	mute	mute	Can't be assesed	Can't be assesed	15.6	na	13.5	na	83.5	na	27.3	na	254	na	0.43	na
Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	flexor	flexor	normal	normal	12.6	8.2	12.6	12.1	82.7	82.5	26.8	26.4	248	302	0.54	na
Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	extensor	extensor	Can't be assesed	Can't be assesed	20.1	na	12	na	68.5	na	21	na	150	na	0.89	na

												RFT						Lipid profile							
DIRECT BILIRUBIN		SGOT/SGPT		ALP		TOTAL PROTEIN		SERUM ALBUMIN		PTI/ INR		BLOOD UREA		SERUM CREATININE		Serum electrolytes(		CHOLESTEROL(T)		Triglycerides		cholesterol (HDL)		cholesterol (LDL)	
At admission	At discharge	At admission	At discharge	At admission	At discharge	At admission	At discharge	At admission	At discharge	At admission	At discharge	At admission	At discharge	At admission	At discharge	At admission	At discharge	At admission	At discharge	At admission	At discharge	At admission	At discharge	At admission	At discharge
0.16	na	25/29	na	101	na	7.2	na	4.27	na	2.27	1.16	25	19	0.95	0.58	144/3.79/114	137/4.35/99	na	na	na	na	na	na	na	na
0.19	na	28/35	na	104	na	7.8	na	4.57	na	1.31	na	62	na	1.69	na	145/3.68/111	na	na	na	na	na	na	na	na	na
0.11	na	48/33	na	71	na	7.8	na	4.73	na	1.05	na	23	37	0.71	0.62	136/4.12/99	138/4.38/98	na	na	na	na	na	na	na	na
0.27	na	19/12	na	128	na	7.2	na	3.89	na	1.12	na	88	76	3.29	2.87	135/4.18/104	139/4.28/99	190	na	113	na	63	na	128	na
0.17	na	29/24	na	100	na	7.9	na	4.28	na	1.1	na	26	47	0.6	0.87	145/3.7/108	140/3.99/101	na	na	na	na	na	na	na	na
2.57	0.14	128/326	13/8	293	101	6.3	6.1	3.44	2.85	1.24	na	59	26	0.97	1.19	126/5.37/87	140/4.30/100	na	na	na	na	na	na	na	na
0.15	na	18/20	na	124	na	7.1	na	4.29	na	1.05	na	21	38	0.78	0.62	138/3.93/101	136/4.32/100	na	na	na	na	na	na	na	na
0.17	na	25/29	na	108	na	6.33	na	3.01	na	1.18	na	47	na	0.99	na	144/3.87/101	na	na	na	na	na	na	na	na	na
0.16	na	20/15	na	123	na	7.7	na	4.14	na	1.18	na	96	na	4.15	na	142/4.53/103	na	na	na	na	na	na	na	na	na
0.18	na	42/46	na	102	na	7.8	na	4.35	na	1.06	na	32	30	0.63	0.98	132/4.53/95	139/4.42/99	na	na	na	na	na	na	na	na
0.27	na	33/31	na	68	na	7.6	na	4.28	na	1.27	na	35	28	1.11	0.85	131/3.8/88	136/4.5/100	na	na	na	na	na	na	na	na
0.3	na	186/86	76/32	91	na	6.5	na	2.43	na	1.23	na	51	na	0.72	na	137/4.24/108	na	na	na	na	na	na	na	na	na
0.07	na	38/41	na	134	na	7.3	na	3.9	na	1.16	na	26	37	0.88	0.74	137/4.16/102	136/4.28/99	na	na	na	na	na	na	na	na
0.23	na	25/37	na	90	na	7	na	4.3	na	1.02	na	19	28	0.91	0.56	143/3.28/103	140/3.89/99	na	na	na	na	na	na	na	na
0.08	na	36/28	na	79	na	8.3	na	4.32	na	1.22	na	29	37	0.95	0.84	133/2.57/92	138/3.99/96	na	na	na	na	na	na	na	na
0.09	na	82/85	na	187	na	8.4	na	4.1	na	1.09	na	51	na	1.53	na	143/3.45/105	na	na	na	na	na	na	na	na	na
0.12	na	24/29	na	101	na	8.2	na	4.32	na	1.05	na	17	na	0.68	na	143/4.41/106	na	na	na	na	na	na	na	na	na
0.45	na	20/25	na	66	na	5.4	na	3.36	na	1.17	na	40	na	1.35	na	119/3.71/84	na	na	na	na	na	na	na	na	na

ICH score at presentation							CT angio with venous cuts	MRI angio with venous cuts	2D ECHO	surgery	Surgical intervention	Morbidity outcome at discharge Using Modified Rankin Scale (mRS)	FOLLOW UP	
Age >= 80 years	Glasgow coma scale (GCS) at presentation	Volume of hematoma on baseline CT scan of brain by ABC/2 formula		Location of hematoma (infratentorial or supratentorial)	Presence of intraventricular extension	Total Score							At 30 days using Modified Rankin Scale (mRS)	At 60 days using Modified Rankin Scale (mRS)
			ICH volume	Infratentorial origin										
no (score 0)	gcs: 9 (score 1)	1	45.24 cm3 (score 1)	no (score 0)	yes (score 1)	3	aneurysm pres	not done	mild conc lvh with ef 60%	yes	yes	score 4	score 4	score 4
yes (score 1)	gcs: 3 (score 2)	1	216.591 cm3 (score 1)	no (score 0)	yes (score 1)	5	not done	not done	na	no	no	score 5	score 6	
no (score 0)	gcs: 13 (score 0)	0	17.28 cm3 (score 0)	no (score 0)	yes (score 1)	1	aneurysm pres	not done	conc lvh with ef 60%	yes	yes	score 4	score 4	score 3
no (score 0)	gcs: 10 (score 1)	1	score 1	no (score 0)	yes (score 1)	3	not done	not done	conc lvh with ghk with ef 32%	no	no	score 4	score 4	score 4
no (score 0)	gcs: 4 (score 2)	0	4.62 cm3 (score 0)	no (score 0)	yes (score 1)	3	aneurysm pres	not done	na	yes	yes- post evd insertion	score 5	score 6	
no (score 0)	gcs: 10 (score 1)	1	score 1	no (score 0)	yes (score 1)	3	not done	not done	na	yes	yes- post evd insertion	score 4	score 4	score 4
no (score 0)	gcs: 15 (score 0)	0	score 0	no (score 0)	no (score 0)	0	not done	not done	normal lv function with ef 60%	no	no	score 4	score 4	score 4
yes (score 1)	gcs: 3 (score 2)	1	score 1	no (score 0)	yes (score 1)	5	not done	not done	na	no	no	score 5	score 6	
no (score 0)	gcs: 8 (score 1)	1	30.051 cm3 (score 1)	no (score 0)	yes (score 1)	3	not done	not done	na	no	no	score 5	score 5	score 4
no (score 0)	gcs: 11 (score 1)	1	42 cm3 (score 1)	no (score 0)	yes (score 1)	3	normal	not done	conc lvh with ef 60%	yes	yes	score 4	score 4	score 4
no (score 0)	gcs: 12 (score 1)	0	score 0	yes (score 1)	yes (score 1)	3	not done	normal	conc lvh with ef 60%	no	no	score 4	score 4	score 4
no (score 0)	gcs: 12 (score 1)	0	score 0	yes (score 1)	yes (score 1)	3	not done	not done	na	no	no	score 4	score 4	score 4
no (score 0)	gcs: 15 (score 0)	0	score 0	yes (score 1)	no (score 0)	1	normal	not done	na	no	no	score 3	score 2	score 1
no (score 0)	gcs: 15 (score 0)	0	score 0	yes (score 1)	no (score 0)	1	not done	not done	conc lvh with ef 60%	no	no	score 3	score 2	score 2
no (score 0)	gcs: 9 (score 1)	1	score 1	no (score 0)	yes (score 1)	3	not done	not done	na	no	no	score 4	score 4	score 4
no (score 0)	gcs: 3 (score 2)	1	77.112 cm3 (score 1)	yes (score 1)	yes (score 1)	5	not done	not done	na	no	no	score 5	score 6	
no (score 0)	gcs: 15 (score 0)	0	score 0	no (score 0)	yes (score 1)	1	normal	not done	conc lvh with ef	no	no	score 2	score 1	score 0
no (score 0)	gcs: 3 (score 2)	1	42 cm3 (score 1)	no (score 0)	yes (score 1)	4	not done	not done	na	no	no	score 5	score 6	

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The Principal,
DMC,Ludhiana.

Subject: **Approval of Plan of Thesis.**

This is to inform you that the Faculty of Medical Sciences in its meeting held on 22.01.2021 has approved the plan of thesis of **Ashish Gupta,** a student of your college for **MD General Medicine** along with the names of Supervisor/Co-Supervisor as under:-

Topic Plan of Thesis
Clinical spectrum of acute intracerebral hemorrhage (ich) and outcome prognostication with ich score

Supervisor
Dr. Gautam Ahluwalia
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Dept. of Medicine,
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Co-Supervisor
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The student has to submit the three copies of thesis (along with PDF format) , to the Controller of Examinations, BFUHS, Faridkot, at least six months before the commencement of theory examination, if he/she is otherwise eligible to take the examination. He /She must directed to attach a photocopy of this letter with the forwarding letter while submitting thesis to the University along with the letter of approval of University for change of supervisor/Co-Supervisor, change of topic,(if any).

S P Singh

Dr. S P Singh MS(Oph)
Controller of Examinations

Note :

1. ***If any discrepancy found regarding topic of thesis or Supervisor/Co-Supervisor, inform undersigned within one month after issue of this letter.***
2. *The student may submit the thesis as per the schedule already conveyed i.e for May/June examination 30th Nov of the preceding the year of examination and for Nov/Dec examinations 31st May of the year of examination.*

CLINICAL SPECTRUM OF ACUTE INTRACEREBRAL HEMORRHAGE (ICH) AND OUTCOME PROGNOSTICATION WITH ICH SCORE

THESIS PROPOSAL

FOR APPROVAL OF SUBJECT OF THESIS TO BE SUBMITTED

IN PARTIAL FULFILMENT OF THE REQUIREMENTS

FOR THE DEGREE OF

DOCTOR OF MEDICINE

IN

MEDICINE

OF THE

BABA FARID UNIVERSITY OF HEALTH SCIENCES

FARIDKOT

NOVEMBER, 2019

DR. ASHISH GUPTA

DEPARTMENT OF MEDICINE
DAYANAND MEDICAL COLLEGE & HOSPITAL
LUDHIANA

ABSTRACT OF PLAN OF THESIS

Title	Clinical Spectrum of Acute Intracerebral Hemorrhage (ICH) and Outcome Prognostication with ICH Score
For the degree of	M.D. (Medicine)
Name of the candidate	Dr. Ashish Gupta
Supervisor	Dr. Gautam Ahluwalia, Professor, Department of Medicine, DMCH, Ludhiana
Co-supervisor	Dr. Gagandeep Singh, Professor and Head, Department of Neurology, DMCH, Ludhiana Dr. Kavita Saggar, Professor and Head, Department of Radiodiagnosis, DMCH, Ludhiana
Institution	Dayanand Medical College and Hospital, Ludhiana
University	Baba Farid University of Health Sciences, Faridkot

Introduction: Acute intracerebral hemorrhage (ICH) is one of the common causes of stroke and is a grave medical emergency with frequent early neurological deterioration or death. Incidence rates are particularly high in Asians and African-Americans and are still the deadliest, most disabling and least treatable type of stroke. This study is designed to study the clinical profile of admitted patient with acute intracerebral hemorrhage (ICH) and to evaluate the utility of ICH score as an outcome predictor.

Aim of Study: To study clinical profile of patients with acute intracerebral hemorrhage and to evaluate the utility of ICH score as an outcome predictor in a resource-limited setting.

Materials and Methods: The study will include patients with acute intracerebral hemorrhage (ICH) admitted in medical wards and/or neurology ward and/or intensive care units of medicine and other specialities and/or emergency at Dayanand Medical College and Hospital, Ludhiana. Duration of study will be from 1st Jan 2020 to 31st May 2021 or 100 patients whichever is earlier.

Clinical Significance: In a resource-limited setting; proper utilization of resources and maximizing their cost effectiveness is extremely important. In this study; ICH score is being evaluated as a bedside tool to predict immediate outcome during hospitalization and short term outcome after discharge to identify patients requiring special care to maintain their quality of life.

Keywords: intracerebral hemorrhage, intracerebral hemorrhage score.

(Signature)	(Signature)	(Signature)	(Signature)	(Signature)
Candidate	Co-supervisor	Co-supervisor	Supervisor	Principal

CERTIFICATE OF FACILITIES AVAILABLE

This is to certify that the facilities for work on the subject of thesis entitled "**Clinical Spectrum of Acute Intracerebral Hemorrhage (ICH) and Outcome Prognostication with ICH Score**" exist in the Department of Medicine, Dayanand Medical College and Hospital, Ludhiana and will be provided to the candidate. We will see that the data being included in the thesis are genuine and is collected by the candidate himself under our supervision and guidance.

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APPROVAL PROFORMA
BY RESEARCH and ETHICAL COMMITTEE
DAYANAND MEDICAL COLLEGE and HOSPITAL, LUDHIANA

Name of candidate	Dr. Ashish Gupta
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Dr. Jaspal Singh (Professor & Head, Surgery)	Mr. A K Jindal (Member, Ethics Committee)
Dr. Dinesh Gupta (Professor & Head, Medicine)	Dr. Anu Sharma (Professor, Anatomy)
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PROFORMA FOR REGISTRATION OF SUBJECT FOR DISSERTATION

1	NAME OF THE CANDIDATE AND ADDRESS	Dr. Ashish Gupta Post Graduate Resident Department of Medicine Dayanand Medical College and Hospital, Ludhiana
2	NAME OF THE INSTITUTE	Dayanand Medical College and Hospital
3	COURSE OF STUDY AND SUBJECT	DOCTOR OF MEDICINE
4	DATE OF ADMISSION OF COURSE	1st MAY, 2019
5	TITLE OF THE TOPIC	Clinical Spectrum of Acute Intracerebral Hemorrhage (ICH) and Outcome Prognostication with ICH Score

6. BRIEF RESUME OF THE INTENDED WORK

6.1 NEED FOR THE STUDY

Acute intracerebral hemorrhage (ICH) is one of the common causes of stroke and is a grave medical emergency of the highest degree with frequent early neurological deterioration or death.[1] It accounts for approximately 10-20% of all strokes and is still the deadliest, most disabling and least treatable type of stroke.[1] Incidence rates are particularly high in Asians and African-Americans compared to White population in United States and Europe and is associated with high mortality and morbidity than cerebral infarction or subarachnoid hemorrhage.[1,2]

Burden of stroke occurrence, morbidity and mortality is much higher in developing nations compared to developed nations.[1,2] Mortality rate with ICH is as high as 32% to 50 % of patients die within first month and only 20% are independent at 6 months.[1,2] There is considerable interest in predicting outcome after ICH and studies have investigated the relationship of various clinical, hematological, biochemical and radiological factors and poor outcome.[1,2]

Causes of ICH include chronic hypertension, arteriovenous malformation (AVM), ruptured Aneurysms, bleeding diathesis-coagulation Disorders, use of anticoagulants and thrombolytic agents, hemorrhage into a cerebral infarct, bleeding into Brain Tumors and drug abuse.[1,2] Hypertension, coagulopathy, sympathomimetic drugs (cocaine, methamphetamine),and cerebral amyloid angiopathy cause the majority of these hemorrhages.[2]

There is paucity of Indian literature on the utility of ICH Scores in prognostication and outcome in patients with acute ICH as most of the literature on mortality and morbidity predictors in acute ICH is available from the developed nations. [1,2]

In a resource-limited setting like India; proper utilization of resources and maximizing their cost effectiveness is extremely important. Therefore, there is an urgent need to study rapidly and accurately measurable criteria at the time of presentation regarding mortality and morbidity predictors in a common medical conditions like

ICH to enable health care professionals to make robust and evidence-based decisions in our country.

In this study; ICH score is being evaluated as a tool to predict immediate outcome during hospitalization and short term outcome after discharge to identify patients requiring special care to maintain their quality of life.

6.2 REVIEW OF LITERATURE

Primary intracerebral hemorrhage is defined as acute stroke in which necropsy or CT demonstrates the origin of hemorrhage as the cerebral parenchyma.[1] Causes of ICH include chronic hypertension, arteriovenous malformation (AVM), ruptured Aneurysms, bleeding diathesis- coagulation Disorders, use of anticoagulants and thrombolytic agents, hemorrhage into a cerebral infarct, bleeding into Brain Tumors and drug abuse.[1,2] Hypertension, coagulopathy, sympathomimetic drugs (cocaine, methamphetamine),and cerebral amyloid angiopathy cause the majority of these hemorrhages.[2] Primary intracerebral hemorrhage refers to intracerebral hemorrhage in the absence of a single clear underlying lesion and is the most frequent type of ICH.[3] Intracerebral hemorrhage can occur as a complication of pre-existing lesion, such as vascular malformation or tumor, which is then referred to as secondary ICH.[3]

Hypertension is the single most important risk factor for ICH.[3] Hypertensive ICH usually results from spontaneous rupture of a small penetrating artery deep in the brain. The common sites are the basal ganglia (especially putamen), thalamus, cerebellum, and pons. The small arteries in these areas seem most prone to hypertension-induced vascular injury. When hemorrhages occur in other brain areas or in non-hypertensive patients, greater consideration should be given to other causes such as hemorrhagic disorders, neoplasms, vascular malformations, and cerebral amyloid angiopathy.[2,3] The putamen is the most common site for hypertensive hemorrhage, and the adjacent internal capsule is usually damaged. Contralateral hemiparesis is therefore the sentinel sign. [2,3]

Thalamic hemorrhages also produce a contralateral hemiplegia or hemiparesis from pressure on, or dissection into, the adjacent internal capsule. A prominent sensory deficit involving all modalities is usually present. Aphasia, often with preserved verbal repetition, may occur after hemorrhage into the dominant thalamus, and constructional apraxia or mutism occurs in some cases of nondominant hemorrhage.

In pontine hemorrhages, deep coma with quadriplegia often

occurs over a few minutes. Typically, there is prominent decerebrate rigidity and "pinpoint" (1 mm) pupils that react to light. Most patients with deep coma from pontine hemorrhage ultimately die, but small hemorrhages are compatible with survival.

Cerebellar hemorrhages usually develop over several hours and are characterized by occipital headache, repeated vomiting, and ataxia of gait. In mild cases, there may be no other neurologic signs except for gait ataxia. Dizziness or vertigo may be prominent. There is often paresis of conjugate lateral gaze toward the side of the hemorrhage, forced deviation of the eyes to the opposite side, or an ipsilateral sixth nerve palsy.

Advancing age and hypertension are most important risk factors for ICH. ICH occurs slightly more frequently among men than women and is significantly more common among young and middle- aged blacks than whites of similar ages.[3,4]

Cerebral amyloid angiopathy (CAA), a condition that increases with age, is the second most common risk factor. Cerebral amyloid angiopathy is an important cause of lobar ICH, especially in the elderly individuals. This condition results from amyloid protein deposition in cortical arterioles, which can lead to leakage of blood through the vessel wall; such deposition is rare in the basal ganglia and brain stem (usual locations of HTN-related ICH and unusual locations of CAA-related ICH). Apart from intracerebral hemorrhage, cerebral amyloid angiopathy also increases the risk of Alzheimer's disease, suggesting partly overlapping mechanisms between intracerebral hemorrhage and Alzheimer's disease.[3,4]

ICH generally presents as the abrupt onset of a focal neurologic deficit. Although clinical symptoms may be maximal at onset, commonly the focal deficit worsens over 30–90 min and is associated with a diminishing level of consciousness and signs of increased ICP such as headache and vomiting. Seizures are uncommon.[5]The early progression of neurological deficit in ICH is frequently due to ongoing bleeding and enlargement of the hematoma during first few hours.[5,6] The level of consciousness is assessed by the Glasgow outcome

scale.[7] Large hematomas usually lead to a decreased level of consciousness as a result of increased intracranial pressure (ICP). An early decrease in level of consciousness is seen in 50% of patients with ICH, an uncommon early finding in patients with ischemic stroke.[7]

Headache occurs in 40% of patients with ICH, compared with 17% of patients with ischemic stroke [7,8] Vomiting is an important diagnostic sign, particularly if the hematoma lies within the cerebral hemisphere. Vomiting is common in patients with a stroke of any type in the posterior fossa.[8] Seizures occur in 6-7% of patients with ICH but are more common with lobar than deep hemorrhages.[8] Elevation in blood pressure, often to very high levels, occurs in as many as 90% of patients with ICH.[9] In case of intracerebral hemorrhage blood pressure will increase in face of increased intracranial pressure (ICP) (Cushing response) to maintain cerebral perfusion pressure and systolic pressure may outgain diastolic pressure, creating a higher pulse pressure so pulse pressure may be a surrogate for increased intracranial pressure and is associated with fatal outcome.

The initial blood pressure should be maintained until the results of the CT scan are reviewed and demonstrate an intracerebral hemorrhage (ICH). In theory, a higher blood pressure should promote hematoma expansion, but it remains unclear if lowering of blood pressure reduces hematoma growth. Recent clinical trials have shown that systolic blood pressure (SBP) can be safely lowered acutely and rapidly to <140 mmHg in patients with spontaneous ICH whose initial SBP was 150–220 mmHg.

Origin of the region that contains hemorrhage is classified as [10,11].

- Deep (include caudate, putamen, globus pallidus, thalamus, internal capsule, deep periventricular white matter, ventricles)
- Lobar (cortex and subcortical white matter)
- Cerebellar
- Brainstem (pontine)

For a few larger hemorrhages, the distinction between hemorrhages that began in the cortex or subcortical white matter (lobar) and those

that originated in the periventricular white matter (deep) is difficult.[11] Deep white matter hemorrhages must have had hemorrhage within 1 cm of the body of lateral ventricle and majority of the hemorrhage within the deep white matter.[11]

Several scales for prediction of ICH mortality have been designed till date with different characteristics regarding applicability, scale components, scoring and performance.[12] Of them, the ICH score has proven to be reliable in predicting 30-day mortality in different populations and clinical circumstances. The ICH score is a validated tool for predicting mortality after hemorrhagic stroke.[1,9,12] ICH score is simple, less time consuming in its calculation, reliable, reproducible, user friendly (does not require any special training in neurology or radiology). [10,12]

The ICH score is a 6 point calculation based on five clinical indicators: [12,13]

1. Age >= 80 years
2. Glasgow coma scale (GCS)
3. Volume of hematoma on baseline CT scan
4. Location (infratentorial or supratentorial)
5. Presence of intra-ventricular extension

Each parameter is given a score from 0 to 1; except GCS which ranges from 0 to 2.

a. Age >= 80 years: yes=1, no= 0.

b. Glasgow coma scale (GCS): GCS score 3 to 4 (= 2 points); GCS score 5 to 12 (=1); GCS score 13 to 15 (=0).

c. Volume of hematoma on baseline CT scan of brain: ICH volume >= 30 cm3 (=1); ICH volume < 30 cm3 (=0) by ABC/2 formula.[12]

ABC/2 formula: A is the greatest diameter on the largest hemorrhage slice, B is the diameter perpendicular to A, and C is the approximate number of axial slices with hemorrhage multiplied by the slice thickness.[9,12] The lethal volume of parenchymal hemorrhage varies by location.[12,13] The mortality for lobar hemorrhage is slightly less than deep, pontine and cerebellar hemorrhage.[13,14]

d. Location of hematoma (infratentorial or supratentorial): infratentorial

origin (yes=1) (no=0).

e. Presence of intraventricular extension: yes =1; no= 0.

Mass effect quantified according to whether or not there is compression of surrounding structures and mid line shift of the pineal or septum pellucidum.[12,13,14]

• Score ranges from 0 to 6

• As the score increases from 0 to 6, it indicates worsening in the outcome

Disability status of survivors (morbidity) can be assessed using Modified Rankin Scale (mRS) [15,16]

Modified Rankin Scale (mRS)

The scale runs from 0-6, running from perfect health without symptoms to death

0 - No symptoms.

1 - No significant disability. Able to carry out all usual activities, despite some symptoms.

2 - Slight disability. Able to look after own affairs without assistance, but unable to carry out all previous activities.

3 - Moderate disability. Requires some help, but able to walk unassisted.

4 - Moderately severe disability. Unable to attend to own bodily needs without assistance, and unable to walk unassisted.

5 - Severe disability. Requires constant nursing care and attention, bedridden, incontinent.

6 – Dead

Incidence and prognosis of patients who suffer intracerebral hemorrhage (ICH) have been affected by two significant developments. [17,18]

a. The advent of aggressive treatment of hypertension has muted the effect of major risk factor while the development of the computed tomography (CT) scan has made possible the identification of small hemorrhages with more benign courses that may previously have been mistaken for ischemic infarcts. [17,18]

b. The advent of computed tomography (CT) has permitted earlier and more accurate diagnosis of ICH. [17,18]

The overall effect has been a decreased fatality rate for ICH from earlier estimates in part because of detection of smaller lesions with better prognosis.[18]

Low GCS score, intraventricular extension of blood, large hemorrhage size, coma, ataxic respiration, abnormal pupils, Hyperglycemia, pulse pressure, midline shift, kidney dysfunction were associated with poor outcome of ICH patients.[5,6,10] with the poor level of consciousness at the time of hospital admission (often assessed as GCS score),hematoma volume and to a lesser extent, volume of intraventricular hemorrhage most consistent outcome predictors.[4,7,19,20] Hyperglycemia may aggravate brain edema and increase neural cell death Comatose conditions indicate direct involvement of the reticular activating system in the brainstem tegmentum or elevated intracranial pressure with increased damage to brain.[19,20] Patients with uremia and dialysis dependency still had a poor outcome due to their tendency to bleed.[20]

Though individual patients appear to benefit, there is yet no well defined population whose outcome consistently improves with surgery. [21,22] The accurate determination of prognosis in medically treated ICH is an essential, and still elusive, first step in defining the patient population likely to benefit from surgery.[21]

Computed tomography (CT) is the key part of the initial diagnostic evaluation.[21,22]

First, it clearly differentiates hemorrhagic from ischemic stroke.

Secondly, in addition it demonstrates the size and location of hemorrhage and may reveal structural abnormalities such as aneurysms, arteriovenous malformations, and brain tumors that caused the ICH as well as structural complications such as herniation, intraventricular hemorrhage, or hydrocephalus[22] and the advent of CT scanning made it possible to diagnose ICH reliably during life and to group patients by lesion location- Lobar, Thalamic, Basal ganglia, cerebellar and brain stem.[9,22]

Although Magnetic resonance imaging (MRI) and Magnetic resonance angiography (MRA) may miss small aneurysms and vascular malformations, it is superior to CT and angiography in detecting cavernous malformations.[21,22]

Rohit Bhatia et al. studied factors associated with in hospital mortality in patients with ICH, the disability status of patients by modified Rankin Scale (mRS) at the time of discharge and concluded that low GCS, higher baseline hematoma volume, presence of Intraventricular hemorrhage and need for ventilatory assistance are independent predictors of mortality. Surgery did not improve mortality or outcome and most of the survivors were significantly disabled at discharge.[1]

Piyush Ojha et al. concluded that ICH score is a useful tool to predict outcome during hospitalization, on discharge, 1 month and 2 month follow up. The independent predictors of increased mortality are presence of vomiting, seizures, loss of consciousness, lower GCS (<=8), higher ICH score and ventilatory requirement. Statistically significant radiological features associated with mortality include infratentorial location, presence of hydrocephalus, higher midline shift, intraventricular extension of hematoma and a higher baseline hematoma volume. ICH score assessment and documentation should become standard procedure in acute care and follow up of patients with intracerebral hemorrhage.[2]

M. Arfan Ikram et al. concluded that intracerebral hemorrhage is a multi-factorial disease caused by several interacting and overlapping risk factors and etiologies. Hypertension remains the most important risk factor followed by cerebral amyloid angiopathy. However, the increased use of anticoagulants poses new challenges to better prevent intracerebral hemorrhage as complication. Beside hypertension other risk factors for intracerebral hemorrhage are smoking, alcohol and diabetes mellitus.[3]

Jose L. Ruiz- Sandoval et al. used all the components of ICH score (age, Glasgow coma scale, ICH location, ICH volume and intraventricular extension) with different cut offs and concluded that

Compared with the ICH score, ICH-GS explained more variance in the 3 outcome measures, had higher sensitivity in predicting in-hospital and 30-day mortality, and performed equally well in predicting good functional outcome at 30 days follow up. Moreover, ICH-GS had higher accuracy than the ICH score in predicting mortality and good functional outcome. Factors associated with mortality were age 65 or more years, GCS at hospital admission less than 8, ICH volume more than 70ml, irruption into the ventricular system, and infratentorial location of the hematoma.[5]

Ya- Ching Chuang et al. concluded that the accuracy of sICH score was 80.5%, the sensitivity was 82.5% and the specificity was 80.2%. The AUCs are: sICH score, 0.89 (0.89-0.94); ICH score, 0.74 (0.65-0.83) and ICH-GS, 0.74 (0.65-0.83). The sICH score is a very suitable model for risk stratification for predicting 30-Day mortality of intracerebral hemorrhage. Also it can permit standardization of assessment and prognostication.[6]

J. Claude Hemphill III et al. concluded that the ICH score is a simple clinical grading scale that allows risk stratification on presentation with ICH. The use of a scale such as the ICH score could improve standardization of clinical treatment protocols and clinical research studies in ICH.[7]

Stanley Tuhrim et al. studied factors predictive of 30-day outcome after ICH and concluded that the nine univariate factors statistically associated with outcome were GCS score, systolic blood pressure, pulse pressure, horizontal and vertical gaze palsies, severity of weakness, presence of brainstem-cerebellar deficits, interval stroke course and parenchymal hemorrhage size. After using step down variable selection procedure a logistic regression model was obtained containing only GCS score, hemorrhage size and pulse pressure to correctly categorize 92% of the patients alive or dead at 30 days after onset of ICH.[9]

J P Broderick et al. studied powerful and easy to use predictor of 30-day mortality after ICH and concluded that volume of intracerebral hemorrhage was the strongest predictor of 30-day mortality for all

locations of ICH. Using three categories of parenchymal hemorrhage volume (0 to 29 cm3, 30 to 60 cm3, and 61 cm3 or more), calculated by a quick and easy to use ellipsoid method, and two categories of the GCS scale (9 or more and 8 or less), 30 day mortality was predicted correctly with a sensitivity of 96% and a specificity of 98%. Patients with a parenchymal hemorrhage volume of 60cm3 or more on their initial CT and a GCS score of 8 or less had a predicted mortality of 91%. Patients with a volume of less than 30 cm3 and a GCS score of 9 or more had a predicted 30-day mortality of 19%. So volume of intracerebral hemorrhage, in combination with the initial GCS scale score, is a powerful and easy to use predictor of 30-day mortality and morbidity in patients with spontaneous ICH.[10]

Stanley Tuhrim et al. previously reported logistic regression model for predicting 30-day survival after spontaneous ICH. Two factors not collected previously -hyperglycemia and intraventricular hemorrhage extension were assessed and intraventricular hemorrhage extension contributed significant predictive information in a logistic regression, whereas hyperglycemia did not. And the resulting four-factor model (GCS score, hemorrhage size, pulse pressure and intraventricular hemorrhage extension) correctly classified the survival status of 94% of patients at 30 days.[11]

Aimee M. Aysenne et al. concluded that ICH score calculated 24 hours after admission is a better predictor of mortality than the ICH score calculated on admission. Early determination of the ICH score may incorrectly estimate the severity and expected outcome after ICH. Due to dynamic nature of ICH with high risk of hematoma expansion, new IVH, decreasing level of consciousness and delayed measure of the ICH score (24-hour ICH score) is better outcomes predictor.[13]

Seppo juvela et al. concluded that in addition to severity and location of hemorrhage, the age of the patient and amount of alcohol consumed within 1 week seem to be independent determinants of outcome after intracerebral hemorrhage.[14]

P Daverat et al. assessed death and functional outcome after 6 months of spontaneous intracerebral hemorrhage and found that five

independent predictors of outcome at 6 months are age, hemorrhage size, intraventricular spread of the hemorrhage, limb paresis and communication disorders. Of these, age was the most important predictor.[15]

Russell K Portenoy et al. concluded that low GCS score, coma, ataxic respiration, abnormal pupils, acute hypertension, large hemorrhage size and intraventricular extension of blood were associated with poor outcome. Multivariate analysis using logistic regression identified three variables, the GCS score, hemorrhage size and intraventricular hemorrhage extension of blood most predictive of outcome.[16]

Michal A. Douglas at al. studied long term prognosis of hypertensive intracerebral hemorrhage and concluded that the status of alertness, EKG and clinical impression on admission were significant prognostic factors. Mortality increased with size of hematoma and ventricular rupture. Acute in hospital mortality was 40%. 45% of the survivors were fully ambulatory and another 31% ambulatory with assistance after almost 3 years. 17% died during the follow up period. Most patients' functions remained the same at follow up as it had been at discharge from the initial hospitalization. So the patients who have survived a primary (hypertensive) ICH have a relatively good prognosis for recovery of function. Hypertensive intracerebral hemorrhages, unlike aneurysms, rarely, if ever, rebleed. Patients are not likely to have a second bleed in another location. Hypertensive intracerebral hemorrhage is more common in black, especially young adult males with severe hypertension, but overall mortality is lower than thought prior to the CT scan. Most survivors can achieve independence and deserve aggressive medical care and rehabilitation efforts.[17]

S.E. Vermeer et al. concluded that patients who recovered from a primary intracerebral hemorrhage had a 2.1% to 5.9% annual rate of recurrence, vascular death, or vascular events. Age of 65 years or older more than doubled the risk of recurrence, vascular event or death and the risk of vascular events in men was increased twofold.[18]

Matthew L. Flaherty et al. concluded that the incidence rates of

ICH are known to be higher in American blacks than whites possibly due to excess of hemorrhages in young and middle-aged persons, particularly for deep cerebral and brain stem locations. The most plausible explanation for this difference is variation in the prevalence and treatment of hypertension, although other risk factors may contribute.[19]

6.3 AIMS AND OBJECTIVES OF THE STUDY

- To study clinical profile of patients with acute intracerebral hemorrhage
- To evaluate the utility of ICH score as an outcome predictor in a resource-limited setting

7. MATERIALS AND METHODS

7.1 Source of Data

Patients admitted in medical ward and/or neurology ward and/or intensive care units of medicine and other allied specialities and/or emergency in Dayanand Medical College and Hospital. This is a prospective observational study designed to study the clinical profile of admitted patient with acute intracerebral hemorrhage (ICH) and to evaluate the utility of ICH score as an outcome predictor.

7.2 METHOD OF COLLECTION OF DATA

Inclusion Criteria

1. Age > 18 years
2. Patients with acute Intracerebral hemorrhage

Exclusion Criteria

1. History of trauma
2. Patients who denied informed consent

DURATION OF STUDY

From 1st Jan 2020 to 30th April 2021 or 100 patients; whichever is earlier.

OUTCOME

The following variables will be evaluated:

- Clinical/laboratory/radiological/treatment profile of patients
- ICH Score at presentation
- Length of stay in hospital (intensive care unit and/or ward)
- Neurosurgical Intervention(s); if any
- Details of pre-admission workup and treatment outside; wherever available
- At discharge: Morbidity outcome (disability status of survivors) at using Modified Rankin Scale (mRS)
- Follow-up: Patient or caregiver will be followed up at 30 days and 60 days using mRS in-person or telephonically; wherever feasible

STATISTICAL ANALYSIS

Data will be described in terms of range; mean ± standard deviation, frequencies (number of cases) and relative frequencies (percentages) as appropriate. All statistical calculations will be done using SPSS (Statistical Package for the Social Science) SPSS 21 version statistical program for Microsoft Windows.

7.3 DOES THE STUDY REQUIRE ANY INVESTIGATIONS OR INTERVENTIONS TO BE CONDUCTED ON PATIENTS OR OTHER HUMANS OR ANIMALS? IF SO, PLEASE DESCRIBE BRIEFLY.

Radiological investigations- NCCT head

Other investigations as performed by treating unit will be evaluated.

7.4 HAS ETHICAL CLEARANCE BEEN OBTAINED FROM YOUR INSTITUTION IN CASE OF 7.3?

Attached herewith

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PROFORMA

Sr. no: Ward/Unit:

Name DOA

Age DOD

Gender MRD No:

Address

Mobile no Admn No:

Outcome of the patient: Discharge / Death / DAMA / Discharge on request

Outcome diagnosis:

Length of stay:

In Ward ------ Days

In ICU -------Days

Chief complaints at the time of admission:

CNS symptoms:

1. Disorientation
   i. To time / place and person

   ii. Onset

   iii. Progression

   iv. Present status

Signature of Candidate **Signature of Co-Supervisor** **Signature of Supervisor**

v. Episodic or continuous

vi. Orientation between the episodes

vii. Any abnormal behaviour

viii. Recovery

2. Weakness

i. Onset

ii. Progression

iii. Present status

iv. Proximal / distal

v. Symmetrical / asymmetrical

vi. Fatigability

vii. Gaze preference

viii. Selectivity of muscles

3. Headache

i. Onset ii. Location iii. Duration

iv. Diurnal variation v. Severity vi. Timing

Signature of Candidate **Signature of Co-Supervisor** **Signature of Supervisor**

vii. Frequency (no. of episodes in a day)

viii. Preceded by aura

ix. Abnormal sweating

x. Associated with:

Nausea

Vomiting

Photophobia

Phonophobia

Abnormal behaviour

Loss of consciousness

Blurring of vision

xi. Aggravated by

xii. Relieved by

4. Seizures

i. Onset

ii. Activity at the time of incident

iii. Preceded by

headache/ giddiness/ presyncope/ visual disturbance

iv. Associated with

involuntary movement/ Tonic / clonic / focal / generalized

v. Rolling up of eyes

vi. Stare

vii. Tongue bite

viii. Urinary incontinence

ix. Stool incontinence

x. Lasted for (duration)

xi. Recovered after- spontaneous / treatment

xii. Post recovery- drowsiness/ confusion/ alert

xiii. Number of episodes

xiv. Sensorium in between episodes

xv. Last episode

xvi. Any injury sustained

5. Speech disturbance

i. Onset

ii. Comprehension

iii. Any spontaneous speech / word outflow

iv. Slurring

v. Progression

vi. Reading / writing / repetition

6. Sensory system

i. Onset

ii. Progression

iii. Present status

iv. Unable to feel clothes over the body

v. Difficulty in walking in the dark

vi. Slipping of slippers without knowledge

vii. Cotton wool sensations over the feet

viii. Band like sensation/ Encasement of limbs

ix. Pins and needles/ numbness/ tingling/ paraesthesias

x. Hot and cold water during bath

xi. Burning / shooting / pricking pain

xii. Root pain

7. Autonomic system

i. Bladder

a. Urgency / urge incontinence

b. Frequency

c. Hesitancy

d. Retention (painful/painless) and (aware / unaware)

e. Overflow incontinence/ incomplete evacuation/ dribbling of urine

f. Loss of social inhibition

g. Erectile dysfunction

ii. Stool incontinence

iii. Faintness/ palpitations

iv. Abnormal sweating/ decreased lacrimation

8. Cerebellar

i. Dizziness

ii. Vertigo

iii. Incoordination during picking up objects

iv. Occipital headache

v. Vomitings

vi. Gait ataxia

Signature of Candidate **Signature of Co-Supervisor** **Signature of Supervisor**

CVS Symptoms:

Abdominal symptoms:

Genitourinary symptoms:

Respiratory symptoms:

Signature of Candidate **Signature of Co-Supervisor** **Signature of Supervisor**

Similar type of attacks in the past-

Recovery-

Comorbid disease: Duration Drugs Control

1. Diabetes mellitus
2. Hypertension
3. CAD
4. Dyslipidaemia
5. Valvular heart disease
6. Prosthetic heart valve
7. CKD
8. CLD

Surgical history:

Occupational history:

Signature of Candidate **Signature of Co-Supervisor** **Signature of Supervisor**

Personal history:

- Vegetarian/Non vegetarian

- Smoker/Non smoker

  Duration: Smoking index:

- Alcoholic/Non alcoholic:

  Duration: Quantity:

- Substance abuse (cocaine / methamphetamine / other)

Family history: Hypertension/ Diabetes mellitus/ CAD/ Epilepsy/ Similar illness among other members of family

Drug history: Intake of oral contraceptives and for how long

Anticoagulants

Antiplatelets

Signature of Candidate **Signature of Co-Supervisor** **Signature of Supervisor**

General physical examination

Sensorium

Nutritional assessment- body weight height BMI

Vitals on admission

Pulse: Rate Rhythm Volume

Peripheral pulses Carotid bruit

SBP DBP MAP

Postural fall RR Temp

Pallor Icterus Cyanosis

Clubbing LAP Edema – Pitting/not

Trachea Thyroid JVP

GCS on admission

- Eye
- Verbal
- Motor

Signature of Candidate **Signature of Co-Supervisor** **Signature of Supervisor**

x

- **Systemic examination**

Central nervous system

1. **Higher mental function**

   a. Consciousness

   b. Oriented to time / place and person

   c. Attention / calculation

   d. Recall

   e. Language-Speech
      i. Comprehension
      ii. Naming
      iii. Reading
      iv. Writing
      v. Repetition
      vi. Any spontaneous speech / word outflow
      vi. Slurring

2. **Cranial nerves**

   I -Smell to commonly used items like soap/ shampoo/ toothpaste

   II -Visual acuity

   -RAPD

   -Fundus

   III, IV & VI

   -Position of eye at primary gaze

   -Ptosis

   -Ocular movements

   - Conjugate eye movements

   Convergence / divergence

- Ex / Enophthalmos

- Pupils

Size	Right	Left
Reaction to light- Direct Consensual		
Reaction to convergence		

-Diplopia

-Nystagmus

V -Facial sensation- touch / pain / vibration

-Muscles of mastication- clench the teeth

-Corneal reflex

-Jaw reflex

VII - Facial asymmetry

-Wrinkling of forehead

- Frowning of eyebrows / eyelid closure

- nasolabial fold

- Angle of mouth deviation

- Drooling of saliva

- Parotid swelling / Tenderness

VIII- Hearing impairment

- Giddiness

-Tinnitus

-Vertigo

IX & X

- Uvular position

- On saying ""AH"" uvula / palatal movement

- Dysphagia – solids / Liquids / Both

-Dysphonia

- Nasal Regurgitation

- Hoarseness of voice / Nasal twang

- Gag reflex

XI - Shrugging of shoulders

-Neck movements

XII- Tongue position in resting state / on protrusion

- Flaccidity / fasciculations of tongue muscles

- Movements / deviation of tongue

- Dysarthria

3. **Motor System**

a. Position / attitude of limbs

b. Bulk (wasting / hypertrophy)

c. Tone (Spasticity / flaccidity)

d. Power

	Right	Left
i. Shoulder-	Abduction- Adduction- Flexion - Extension-	
ii. Elbow-	Flexion- Extension-	
iii. Wrist-	Dorsiflexion palmar flexion	
iv. Hand grip-	percentage	myotonia (+/-)
v. Hip-	Abduction- Adduction- Flexion- Extension-	
vi. Knee-	Flexion- Extension-	
vii. Ankle-	Dorsiflexion- Plantar flexion-	

e. Deep tendon reflexes

	Right	Left		Right	Left
Biceps			Knee		
Triceps			Ankle		
Supinator					

Reference: ++++ Clonus +++ brisk; ++ normal ; + sluggish ; - absent

f. Superficial reflexes

	Right	Left
Abdominal Upper		
Abdominal Lower		
Cremasteric		
Plantar		

4. **Sensory System:**
   a. Superficial sensations
      i. Touch
      ii. pin prick sensation

   b. Deep sensations
      i.Pain

   c. Combined
      i.Vibration
      ii. joint position

   d. Rhomberg's sign

   e. Pattern of sensory loss
      i. Symmetrical /Asymmetrical
      ii. Glove stocking / patchy
      iii. Root level

5. **Cerebellum**
    a. Intention tremor
    b. Rebound phenomenon (Holmes)
    c. Dysmetria
        i. Finger nose test
        ii. Finger nose finger
        iii. Knee shin dragging test
    d. Past pointing
    e. Nystagmus
    f. Alternating movements
        i.Pronation – supination (Dysdiadochokinesia)
        ii. Alternating opening and fisting of both hands
        iii. Opposition of thumb and fingers
        iv. Draw a circle in air with finger
    g. Hypotonia
    h. Gait
    i. Pendular knee jerk

6. **Gait and Stance**

Cardiovascular system

Respiratory system

Per Abdomen

Signature of Candidate **Signature of Co-Supervisor** **Signature of Supervisor**

Investigations

Parameters	At admission	At discharge
Hemogram		
TLC		
DLC		
Hb		
MCV		
MCH		
Platelet		
ESR		
LFT		
Total bilirubin		
Direct bilirubin		
SGOT		
SGPT		
ALP		
Total protein		
Serum albumin		
A:G ratio		
PTI/INR		
RFT		
Blood urea		
Serum creatinine		
Serum electrolytes Na/K/Cl		
Ca/Mg/Phos		
Uric acid		
CRP		
BNP		
Urine R/E		
Viral markers Anti HIV (Rapid/ELISA)		
Anti HCV (Rapid/ELISA)		
HbsAg (Rapid/ELISA)		
Lipid profile [Panel] Cholesterol (T)		
Triglycerides		
Cholesterol (HDL)		
Cholesterol (LDL)		

Signature of Candidate **Signature of Co-Supervisor** **Signature of Supervisor**

ICH score at presentation

a. Age >= 80 years: yes (Score=1) no (Score= 0).

b. Glasgow coma scale (GCS) at presentation:

GCS score 3 to 4	(2 points)
GCS score 5 to 12	(1 point)
GCS score 13 to 15	(0 point)

c. Volume of hematoma on baseline CT scan of brain by ABC/2 formula:

A B C

ICH volume

ICH volume >= 30 cm3	(1 point)
ICH volume < 30 cm3	(0 point)

d. Location of hematoma (infratentorial or supratentorial):

Infratentorial origin yes (Score=1) no (Score=0).

e. Presence of intraventricular extension: yes (Score=1) no (Score= 0)

Total Score:

Signature of Candidate **Signature of Co-Supervisor** **Signature of Supervisor**

Radiological Investigations

- NCCT head

- MRI Brain

Other investigations

- 2 D ECHO

Outside reports

Any other investigations(s)

Signature of Candidate **Signature of Co-Supervisor** **Signature of Supervisor**

Surgical intervention

Morbidity outcome at discharge:
(Using mRS)

No symptoms — Score=0

No significant disability. Able to carry out all usual activities, despite some symptoms. — Score= 1

Slight disability. Able to look after own affairs without assistance, but unable to carry out all previous activities. — Score=2

Moderate disability. Requires some help, but able to walk unassisted. — Score = 3

Moderately severe disability. Unable to attend to own bodily needs without assistance, and unable to walk unassisted. — Score=4

Severe disability. Requires constant nursing care and attention, bedridden, incontinent. — Score =5

Dead — Score=6

Signature of Candidate **Signature of Co-Supervisor** **Signature of Supervisor**

FOLLOW UP	At 30 days	At 60 days
Date-		

Modified Rankin Scale (mRS)

Signature of Candidate	Signature of Co-Supervisor	Signature of Supervisor

INFORMED PATIENT CONSENT

Date: _____

I.....D/o, W/o, S/o.....

am willing to participate in the study **"Clinical Spectrum of Acute Intracerebral Hemorrhage (ICH) and Outcome Prognostication with ICH Score".** The procedure with its complications has been explained to me in local vernacular language. I have fully understood that no special tests and extra expenditure in any form, merely for the purpose of thesis is being carried out. I am free to opt out the study anytime without assigning any reason.

....

Signature of the Witness Signature of the patient

Name:

Signature of Candidate

Signature of Supervisor

Signature of Co-Supervisor

Signature of Co-Supervisor

मरीज अनुमति फार्म

तिथि _____

मैं _____ पत्नी/पुत्र/पुत्री _____

निवासी _____

इस शोधकार्य **"Clinical Spectrum of Acute Intracerebral Hemorrhage (ICH) and Outcome Prognostication with ICH Score"**में भाग लेने के लिए सहमत हूँ। मैं इस शोधकार्य में भाग लेने के लिए अपनी स्वेच्छा से तैयार हूँ। मैं पुष्टि करता/करती हूँ की यह स्वीकृति देने के लिए मुझे कोई आर्थिक प्रलोभन नहीं दिया गया और न ही दबाव डाला गया है। मुझे इस शोधकार्य का उद्देश्य स्पष्ट कर दिया गया है और मुझे यह विश्वास है की यह विज्ञान और मानवता के लाभ के लिए है। मुझे इस शोधकार्य में होने वाले जोखिम के बारे में समझा दिया गया है और मेरी समझ में यह जोखिम बहुत मामुली है।

मैं इस शोधकार्य में भाग लेने के सम्बन्ध में किसी भी समय अपनी अस्वीकृति व्यक्त कर सकता/सकती हूँ और मेरे अस्वीकृति व्यक्त करने का मेरे इलाज पर कोई प्रभाव नहीं पड़ेगा।

_____	_____
गवाह के हस्ताक्षर	रोगी के हस्ताक्षर/अंगूठे का निशान
नाम:	नाम:

_____

अन्वेषक के हस्ताक्षर

_____

विद्यार्थी के हस्ताक्षर

ਮਰੀਜ਼ ਰਜ਼ਾਮੰਦੀ ਫਾਰਮ

ਮਿਤੀ_____

ਮੈ_____ਪਤਨੀ/ਪੁੱਤਰ/ਪੁੱਤਰੀ_____

ਵਾਸੀ

_____

"Clinical Spectrum of Acute Intracerebral Hemorrhage (ICH) and Outcome Prognostication with ICH Score"ਤੇ ਚਲ ਰਹੀ ਖੋਜ ਵਿਚ ਹਿੱਸਾ ਲੈਣ ਲਈ ਰਜ਼ਾਮੰਦ ਹਾਂ। ਇਸ ਖੋਜ ਕੰਮ ਵਿਚ ਹਿੱਸਾ ਲੈਣ ਲਈ ਮੈ ਆਪਣੀ ਮਰਜ਼ੀ ਨਾਲ ਤਿਆਰ ਹਾਂ। ਮੈ ਇਹ ਦਸਣਾ ਚਾਹੁੰਦਾ ਹਾਂ/ ਚਾਹੁੰਦੀ ਹਾਂ ਕੇ ਇਹ ਰਜ਼ਾਮੰਦੀ ਦੇਣ ਵਾਸਤੇ ਮੈਨੂ ਕਿਸੇ ਵੀ ਤਰਾਂ ਦਾ ਲੋਭ-ਲਾਲਚ ਨਹੀ ਦਿੱਤਾ ਗਿਆ ਅਤੇ ਨਾ ਹੀ ਕੋਈ ਦਬਾ ਪਾਇਆ ਗਿਆ ਹੈ। ਮੈਨੂ ਇਸ ਖੋਜ ਦਾ ਮਨੋਰਥ ਸਮਝਾ ਦਿੱਤਾ ਗਿਆ ਹੈ ਅਤੇ ਮੈਨੂ ਇਹ ਭਰੋਸਾ ਦਵਾਇਆ ਗਿਆ ਹੈ ਕੇ ਇਹ ਖੋਜ ਵਿਗਿਆਨ ਅਤੇ ਮਾਨਵਤਾ ਦੀ ਭਲਾਈ ਲਈ ਹੈ। ਮੈਨੂ ਇਸ ਖੋਜ ਵਿਚ ਹੋਣ ਵਾਲੇ ਖਤਰੇ ਬਾਰੇ ਸਮਝਾ ਦਿੱਤਾ ਗਿਆ ਹੈ ਅਤੇ ਮੈਨੂ ਇਹ ਯਕੀਨ ਹੈ ਕੇ ਇਹ ਖਤਰਾ ਬਹੁਤ ਮਾਮੂਲੀ ਹੈ। ਮੈਨੂ ਇਸ ਖੋਜ ਕੰਮ ਵਿਚ ਹਿੱਸਾ ਲੈਣ ਦਾ ਢੰਗ–ਤਰੀਕਾ ਸਮਝਾ ਦਿੱਤਾ ਗਿਆ ਹੈ।

ਮੈ ਇਸ ਖੋਜ ਕੰਮ ਵਿਚ ਹਿੱਸਾ ਲੈਣ ਬਾਰੇ ਆਪਣੀ ਰਜ਼ਾਮੰਦੀ ਕਿਸੇ ਵੀ ਸਮੇ ਵਾਪਸ ਲੈ ਸਕਦਾ ਹਾਂ/ ਸਕਦੀ ਹਾਂ ਅਤੇ ਮੇਰੀ ਰਜ਼ਾਮੰਦੀ ਵਾਪਸ ਲੈਣ ਦਾ ਮੇਰੇ ਇਲਾਜ ਤੇ ਕੋਈ ਅਸਰ ਨਹੀ ਹੋਵੇਗਾ।

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ਗਵਾਹਦੇਹਸਤਾਖਰ ਮਰੀਜ਼ਦੇਹਸਤਾਖਰ

ਮਿਤੀ_____ ਮਿਤੀ_____

ਪਤਾ _____ ਪਤਾ

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ਨਿਰੀਖਕਦੇ ਹਸਤਾਖਰ

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ਸਿਖਿਆਰਥੀ ਦੇ ਹਸਤਾਖਰ